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VOL. XXI

ARCHAEOLOGY OF ALKALI RIDGE, SOUTHEASTERN UTAH

WITH A REVIEW OF THE PREHISTORY OF THE
MESA VERDE DIVISION OF THE SAN JUAN AND SOME
OBSERVATIONS ON ARCHAEOLOGICAL SYSTEMATICS

BY

JOHN OTIS BREW

APPENDICES BY

ALICE BRUES

VOLNEY H. JONES

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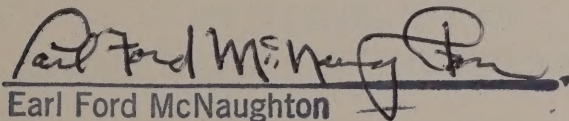
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TO
JAMES ALLEN LANCASTER
Loyal Friend and Associate

PREFACE

THE excavations upon which this report is based were carried on during three field seasons, 1931-33, on Alkali Ridge in San Juan County, southeastern Utah. The Peabody Museum Southeastern Utah Expedition was in camp on Alkali Ridge from November 4 to December 1, 1931; from May 10 to September 5, 1932; and from June 6 to October 14, 1933. Thirteen sites were excavated on the public domain under permit granted to the Peabody Museum of Harvard University by the United States Department of the Interior. The number of rooms cleared was 234, including 195 storage and living rooms and 29 subterranean and semisubterranean pit houses and kivas. In addition to the buildings, 10 refuse mounds were examined.

The expedition was under the direction of the author, assisted throughout by Mr. J. A. Lancaster of Ackmen (now Pleasant View), Colorado. During the last 2 months of the 1932 season and the whole of the 1933 campaign, Mr. Alden B. Stevens of New York City and Santa Fe acted as surveyor and photographer. Mr. James T. Dennison of Harvard University joined the expedition early in July, 1932, and remained until the end of that season.

The following men worked at the excavations for all or part of the 3 campaigns: Messrs. Hugh Pigg, Clarence Patterson, Luke Lancaster, Roy Herren, and Jean Jacques of Ackmen, Colorado; Kelly Tracy of Cahone, Colorado; Elmer Bailey, Donald V. Blake, and Jacob Young of Monticello, Utah; and Ace Black and Silas D. Kartchner of Blanding, Utah. Mr. S. C. Mills of Ackmen and Mr. L. C. Thompson of Blanding served as cooks. I am greatly indebted to my field staff and crew for their superlative work and phenomenal good humor.

I wish to extend my thanks and those of the Peabody Museum to the many people who have assisted me at one time or another in the course of the field work: first of all, to Mr. J. A. (Al) Lancaster, to whose efforts more than to those of any other individual the expedition is indebted for such measure of success as it had; to Dr. A. V. Kidder of the Car-

negie Institution of Washington for his original suggestion of Alkali Ridge and for his continued assistance and unflagging interest throughout; to Mr. Jesse L. Nusbaum, Consulting Archaeologist of the United States Department of the Interior, for his helpful suggestions and co-operation; to Dr. Paul S. Martin, Head Curator of Anthropology, Field Museum of Natural History, Chicago, for the great assistance which his experience in nearby regions of southwestern Colorado enabled him to bestow; to Mrs. William H. Claflin, Jr., of Belmont, Massachusetts, for her generosity in lending the automobile known as "Pecos" for the use of the expedition; to Mr. Earl H. Morris of the Carnegie Institution for valuable suggestions and encouragement in the field; to Mr. B. D. Black of Blanding, Utah, for his kind permission to use the house on his "dry farm" on Alkali Ridge; to Mr. Claude Foy of the Moab Garage Company for his assistance and services as agent of the expedition; to the late W. F. (Twisty) Oliver, who as proprietor of the White Garage at Gallup, New Mexico, served for so many years as guardian angel to Southwestern archaeologists; to Mr. August Weinmann of Ackmen, Colorado; to Mr. Jay Redd of Monticello, Utah; and to the many residents of southwestern Colorado and southeastern Utah who aided in so many ways during the course of the field work.

I also wish to thank my colleagues who have aided me in the preparation and analysis of the specimens and other evidence obtained in the field. I am particularly grateful to Mr. F. P. Orchard, Assistant Curator of Archaeology in the Peabody Museum, and to Mr. Carleton Milanowski of St. Paul, Minnesota, for their extensive aid in the restoration and photographing of specimens; to Dr. Alice Brues for measurement and analysis of the skeletal material; to Mrs. Ruth Sears Chute for assistance in analysis of the pottery; to Messrs. R. P. Wheeler, R. B. Woodbury, and John Hoag of Harvard University for their assistance in the analysis of the stone and bone artifacts; to Dr. Emil W. Haury, Mr. W. S. Stallings, and the late John H. Denison, Jr., for their analyses of

the tree-ring material; to Dr. H. S. Colton, Dr. H. P. Mera, Mr. H. S. Gladwin, and Mr. Elmer R. Smith for their kindness in placing at my disposal the collections of the Museum of Northern Arizona, the Laboratory of Anthropology, Gila Pueblo Museum, and the Museum of the University of Utah, respectively; to Miss Anna O. Shepard of the Carnegie Institution for assistance in pottery analysis; to Miss Eleanor Kerns, Mr. Elmer Rising, Mr. Robert Bremer, and Mrs. C. B. Cosgrove for assistance in the preparation of illustrations; to Miss Cordelia Galt for editorial assistance; to Mrs. William Henry Harrison for aid with the index; and to the members of the Department of Anthropology at Harvard University and the Peabody Museum staff.

To Mr. Gladwin I wish to add my personal appreciation of the inspiration he provided for me to broaden my outlook far beyond the confines of the San Juan and to sharpen my conceptions of events within the local area. The scope of his anthropological speculations is now well known. It has no limit except in convincing counter-attacks by his fellow-workers. I have attempted a few of these herein. With Gladwin, however, one really should work in conversation. He moves too fast for publication. He can abandon any idea the instant convincing refutation appears, without — and this is very important — any sparing or temporizing to “save face.” All of his friends will recognize the tone of the following quotation, which was stated with a grin after 2 days of violent discussion of a certain theory about Mesa Verde pottery: “Well, I was wrong on that one. Now here’s something else, how about this Chacoan stuff; I believe it came up from the south through the Zuni and Puerco country. What do you think of that?” In fact, I shall not be at all surprised if, by the time this is printed, Gladwin has revised upward the dates which he assigned in 1937 to the early Hohokam phases at Snaketown.¹

During the course of the project, I have received immeasurable professional assistance from the late Professor Glover M. Allen, who identified the animal bones; Professor of Physiology, W. J. Crozier; Professor of Physiography, Kirk

Bryan; Dr. Paul Vestal of the Museum of Economic Botany — all of Harvard University; and the following archaeologists and anthropologists: Dr. Clark Wissler, Dr. F. H. H. Roberts, Jr., the late Mr. Charles A. Amsden, Mr. Monroe Amsden, Mr. John Rinaldo, Mr. L. L. Hargrave, and the staffs of the Division of Historical Research of the Carnegie Institution of Washington, the Laboratory of Anthropology at Santa Fe, and Mesa Verde National Park.

Much of the most important material in the introductory sections of this report could not have been included, save through the gracious permission to use unpublished material granted me by Dr. George Woodbury of Bedford, New Hampshire; Dr. C. C. Seltzer of Harvard University; Mr. John Everett Dodge of Norwich Town, Connecticut; and Mr. Don Watson of Mesa Verde National Park.

Parts of the manuscript have been read by some of those mentioned above and by Mr. Watson Smith, Dr. Eliot D. Chapple, Dr. Clyde Kluckhohn, Dr. Philip Phillips, and Dr. Alfred Kidder, II. I am very grateful for the criticisms and encouragement I have received from these men.

My mother has rendered invaluable assistance in many ways, not the least of which was in finding nothing whatever unusual in my ambition, from the age of four onward, to be an archaeologist.

To my wife, who typed the manuscript, inserted reasonable punctuation, expelled solecisms, and coped with my eccentricities of spelling, I extend both thanks and sympathy. Without her assistance this job would still be unfinished.

To the man who started me in this work, saw me through it, criticized every section of the manuscript as it was written, provided inspiration when I was discouraged and a check-rein whenever I got out of bounds, to Professor Donald Scott, Director of the Peabody Museum, I can only say that I hope this report may be worthy of the time and effort that he has put into it.

J. O. BREW

Cambridge, Massachusetts

May 1, 1941

¹ This “prophecy” was confirmed sooner than I expected, within a month after writing, during a visit

by Gladwin to Cambridge. Since then he has published his revision, see Gladwin, 1942.

TERMINOLOGY AND "ANASAZI"

AN ATTEMPT has been made in this report to dispense with specialized terminology insofar as possible. When the meaning of the author can be conveyed by the use of words in accordance with modern dictionary definitions, this has been done. Only when the meaning can not be so conveyed have specialized terms or words in other than their dictionary meanings been employed. Such special usage of words will be explained as it appears for the first time in the main body of the report.

The term "Mesa Verde area" as used herein will include the northern drainage of the San Juan River in southwestern Colorado and southeastern Utah, from the San Juan Mountains to the Colorado River and also part of the Dolores River drainage in southwestern Colorado.

Certain assumptions made and terms used in the descriptions of excavations will be found described and defined on pages 103-05.

However, one term which I shall use perhaps needs elucidation at the outset. The primary purpose of the report, aside from description of actual work done, is to present evidence showing that the prehistoric civilizations of the Southwest which are generally known as Basket Maker and Pueblo represent actually a continuum of cultural development. The validity of the theory that an invasion of Pueblo peoples, of a radically different physical type and bearing, a radically different culture from that of the Basket Makers, occurred at approximately 700 A.D. will be seriously questioned. Although the theory of a Pueblo invasion is still generally accepted, many students in the Southwestern field have recently come to believe that the change in culture at that time was not so great as had originally been supposed. Consequently, a new name has been suggested to label the basic culture pattern of the peoples resident on the great Colorado Plateau in Utah, Colorado, Arizona, and New Mexico who have previously been known as Basket Makers and Pueblos. The new name is "Anasazi."

It seems to me that this has been an unfortunate choice. The word is from the Navajo

language and is used by the Navajo to refer to the ancient people who occupied the ruins and, it should be noted, not used to refer to the modern Pueblo peoples. The Navajo are an Athapaskan group, representing, according to accepted anthropological theory, part of the latest movement of Indian peoples into the Southwest. They are the strongest non-Pueblo Indian group on the Plateau today. Consequently, on these grounds I feel that to use a Navajo word for the Pueblo culture is unwise. If we must have a new word, should it not be taken from one of the Pueblo languages or, since we are writing primarily for English-speaking readers, from the English language?

I should like, however, to raise the question as to whether we are really in need of a new word. The modern phase of the culture we are studying is known anthropologically as Pueblo; the people appear in the census lists as Pueblo; they speak of themselves as Pueblo; they are known to their neighbors as Pueblo; and they will continue to be Pueblo whatever we, as a very small archaeological minority, choose to do about it.

Furthermore, the exigencies of our studies demand the development of so large a number of specialized terms that I think we should refrain whenever possible from introducing new ones. In addition, since presumably we are writing for a much larger group of readers than our colleagues in the field of Southwestern archaeology, it seems to me that new terms should be chosen from the English language or at least not chosen from a non-Indo-European language which bears no direct relation with the objects to be described. We should not disregard the fact that even among the group known as highly educated men a non-Indo-European "jaw breaker" presents a barrier and necessitates a pronouncing glossary.

My contention is that, in this instance, a new term is unnecessary. The evidence now seems to be sufficiently strong to permit us to classify Basket Maker and Pueblo as a single basic culture. The word Pueblo is in general use, and there is no other, to label the group of linguistically diverse peoples who constitute the

modern bearers of this culture. To me the wisest course appears to be that of expanding our definition of Pueblo to include the 2 earliest periods of the culture, as defined, Basket Maker II and Basket Maker III, or, as some students now label them, Basket Maker and Modified Basket Maker. We then would have a term acceptable to the general public, and one in which there would be no contradiction between general usage and scientific usage, since in both cases it would be describing the same culture.

I am told that this would lead to confusion, and that students familiar with the old divisions of Basket Maker and Pueblo would be misled. I can not believe that archaeologists are so unadaptable. In my acquaintance with the work-

¹ Professor Kirk Bryan, after reading this chapter, suggested, as a compromise, that the term "Puebloan" might be used for the Basket Maker-Pueblo culture.

ers in the field I know of no one who would be so confused and misled. Are we not supposed to learn hundreds of new names of pottery types the definitions of which are subject to frequent change?

Consequently, I formally suggest that the term Pueblo be used to designate that assemblage of traits which is generally accepted as the Basket Maker-Pueblo basic culture, and I have so used it in this report.¹ Occasionally in the following pages the hyphenated term appears, for I realize that my definition is unusual and new to many. But in general discussion when I use the word Pueblo, I mean by it the whole culture. Short chronological divisions will be labeled with more specific terms such as Basket Maker III, Pueblo II, etc.

He has since used it in his reports, see Bryan, 1941, footnote 1.

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ARCHAEOLOGY OF
ALKALI RIDGE, SOUTHEASTERN UTAH

INTRODUCTION

THE Peabody Museum Southeastern Utah Expedition arose from discussions between Professor Donald Scott and the author around northeastern Utah camp fires in the canyons of the Green-Colorado in 1931. Both of us were newcomers in the field of Southwestern archaeology and both of us had been struck by one particular gap in the sequence of cultures then recently formalized in the Pecos Classification of 1927 and expanded by Frank H. H. Roberts, Jr. Eight cultural stages had been listed and for all but two of these definite characteristics of house type, weapons, pottery, textiles, etc., had been set down. The first vacancy came at the very beginning, where a culture more primitive than any then known had been assumed on the grounds that something must have preceded Basket Maker II; the other came in the middle of the series, between Pueblo I and Pueblo III, where certain architectural and ceramic types were suggested as logically intermediate. This period was called Pueblo II, but it had not been substantiated by excavation.

The force of the second gap, beckoning to be filled, was of itself sufficient to attract con-

sideration. Consequently, after lengthy discussion and after consultation with A. V. Kidder, who suggested Alkali Ridge as a likely location in which the gap might be filled, the Peabody Museum Southeastern Utah Expedition was inaugurated with the aim to define the culture of Pueblo II or to eliminate it from the Pecos Classification.

But, in addition, behind it all was the question of method of cultural designation — the question of the wisdom and workability of a schematic presentation of cultural development in arbitrary divisions. Thus throughout the report run 2 points of view, and these must be realized by the reader. One, relatively simple, involves only the acceptance of the assumptions of the Pecos Scheme and then proceeds to excavation in an endeavor to fill the gap mentioned previously. The second, more complex, questions the usefulness of our archaeological systematics as applied at present and attempts to evaluate not only the Pecos Classification but also the other schemes which have been erected in the Southwest since the expedition was organized. The results will be correlated with all of these schemes.

PHYSIOGRAPHY AND ECOLOGY

Chairman: Have you any questions to ask the candidate?

Professor Bryan: Yes, didn't these people ever eat?

THE excavations of the Peabody Museum Southeastern Utah Expedition were conducted upon a mesa known as Alkali Ridge in San Juan County, southeastern Utah. Alkali Ridge is not unfamiliar to archaeologists. Presumably, because of the abundance of springs giving forth clear "mountain water," despite the name Alkali, it presents a surprisingly large number of prehistoric sites per square mile (g. 4, p. 9). A. V. Kidder, Neil Judd, and Jesse L. Nusbaum worked on Alkali Ridge in 1908, in a party led by Byron Cummings. Subsequently, Kidder published a paper describing the excavations of that season in a large Pueblo site on the mesa.¹

San Juan County lies in the extreme southeastern corner of Utah and embraces part of the "four-corners country," so called because it is the only locality in the United States where the lands of 4 states come together. The San Juan River, which rises in the San Juan and La Plata mountains of southwestern Colorado, flows in an irregular course across the county. Alkali Ridge is located north of the river, which lies between Alkali Canyon on the west and Devils Canyon and Montezuma Creek on the north and east (figs. 1 and 2). It is a point of land² projecting southeast and then south from the Abajo or Blue Mountains, east of the modern town of Blanding and south of Monticello, the county seat of San Juan County. Abajo Peak, the highest point in the Blue Mountains, as they are locally known, has

an elevation of 11,455 feet and is approximately 23 miles west of the Colorado line and approximately 58 miles north of the Arizona line. East of the mountains and extending into Colorado is what was known to early explorers as "The Great Sage Plain," over 7,000 feet in elevation at the Dolores-San Juan divide and sloping off toward the south and southeast. The floor³ of this plain is composed of Lower Cretaceous Dakota sandstones,⁴ with considerable areas of the fossil-bearing (Mancos) shales of the Middle Cretaceous.⁵ Dakota sandstone also forms the floor of Alkali Ridge. The Dakota formation overlies, unconformably, the Morrison⁶ formation of the Upper Jurassic. It consists of conglomerate, the sandstones, lenticular and cross-bedded.⁷ The rock forming the floor of the mesa is of great importance, particularly to an agricultural people, for it determines to a very large extent the character of the soil. Sandstones of the Navajo-La Plata and McElmo-Morrison groups are predominantly quartzite⁸ and are but sparingly provided with plant food. Shales and sandstones of the Moencopi formation provide relatively little plant food and also, in most places, contain gypsum and other objectionable salts. Shinarump conglomerate and Chinle shale furnish soil of little value to plants. On the other hand, the Cretaceous strata of the region we are studying, including the Dakota sandstones, Mancos shales, and Mesa Verde sandstones, contain a higher proportion of mineral plant

¹ Kidder, 1910.

² Alkali Ridge is but one of many points of land which slope southward toward the San Juan. They are generally called Mesas (Cahone Mesa, White Horse Mesa, Horsehead Mesa, etc.) or Points (Goodman Point, Squaw Point, Bug Point). Locally Alkali is sometimes called Alkali Mesa or Alkali Point but more often Alkali Ridge.

³ In geologic terminology the rock "floor" of a mesa is the top layer of rock, the cap rock.

⁴ In his most recent paper on the region Gregory classifies this layer as "Dakota (?)." Gregory, 1938, pp. 61-62.

⁵ Holmes, 1878.

⁶ See Gregory, 1938, pp. 51-53 for correlation of the terms "Morrison formation" and "McElmo formation." Gregory has abandoned the use of the latter for southeastern Utah where he considers the Morrison to be equivalent to the upper part of the McElmo of the Navajo country in northeastern Arizona and the La Plata region of southwestern Colorado.

⁷ For a complete picture of San Juan country rock formations, see the generalized section in Gregory, 1938, pp. 36-37. In the same paper, plate 15, is a chart correlating the San Juan formations with those of adjoining regions in Utah, Arizona, and Colorado.

⁸ Cross, 1899.

foods than any of the other formations in the region.⁹ It should be noted here that the Hopi country, which at present supports a large Pueblo population and has apparently at times in the past supported an even larger one, is overlain by a sandstone usually classified as Mesa Verde. The important mineral plant foods listed by H. E. Gregory are potash, lime, phosphoric acid, soda, lithia, alumina, oxide of iron, magnesia, and sulphuric acid.¹⁰

The soil of Alkali Ridge and nearby mesas and canyons has an additional advantage. Much of it is eroded material carried by streams from the Blue Mountains. According to Gregory,¹¹ the transported soil is the product of igneous rocks and shale, as well as of sandstone, and therefore contains the essential inorganic plant foods.

In order to produce good crops, such land needs only 2 other natural conditions: (1) sufficient water and (2) a sufficiently long growing season, that is, freedom from killing frost. It is impossible to reconstruct with certainty the climatic situation as it was during the prehistoric centuries when Alkali Ridge was occupied by Pueblo farmers. However, a considerable quantity of varied vegetable material was found in the sites, including not only food supplies but also timbers, shrubs, reeds, and grasses which had been used for structural and other purposes. Insofar as charred and fragmentary pieces could be identified, no plants were found in the ruins which are not present in the vicinity today. Consequently, we seem to be justified in assuming that the climate, as it affected the vegetation, was not very different.

Writing about the San Juan, in general, in 1905 T. Mitchell Prudden says: "It should be remembered, first, that the personal requirements in this respect (water) of these people, as of their successors in this desert country, should not be judged by the standard which a more advanced culture and a different climate

impose; second, that few arid regions are actually as devoid of water as they seem to be, and that a long and close familiarity with a dry country often reveals fairly abundant hidden sources of moderate supply."

The terms by which much of the Southwestern countryside is described by people whose background lies in northern Europe and along the Atlantic seaboard of North America are somewhat misleading. To one used to a heavy cover of thick grasses, deciduous forest, or large evergreens, any other type of country has a tendency to appear to be "desert." It is interesting in this connection to note that to the early Spanish explorers, who in southwestern Europe had been familiar with a type of vegetal cover much different from that of New England or Ohio, the "bad lands" of the Southwest were not the regions of rock and sand but the areas of thick forest growth, like the Defiance Plateau and the Mogollon Rim, where the "Easterner" feels "at home." The Spanish mode of travel, with a complex retinue of herds and flocks, was greatly hampered in such country. To the modern traveler the mesas of the Dakota, Mancos, and Mesa Verde formations north of the San Juan with their thick cover of Pinyon and Juniper trees and intermittent patches of brushland do not even look like "desert." And the one-time "Great Sage Plain" is rapidly becoming one of the largest "dry farming" regions in the United States, with thousands of new acres being planted to pinto beans, potatoes, and cereals every year.

Dry farming, ordinary flood-water farming, and irrigation were practised by the ancient Pueblo inhabitants of the San Juan. Norden-skiöld, in 1891, found and described reservoirs on the Mesa Verde.¹² Artificial prehistoric reservoirs on Squaw Point and Bug Point have been described by Prudden,¹³ and I have seen one on Cahone Mesa, close to the Utah-Colo-rado line.¹⁴ From these reservoirs the water

⁹ Gregory, 1916.

¹⁰ Gregory, 1916.

¹¹ Gregory, 1938, p. 21.

¹² Nordenskiöld, 1893, pp. 72-74, figs. 42-44. Five dams are mentioned specifically. Then Norden-skiöld says, "... in the neighborhood of all the large ruins we generally find one or more reservoirs, de-stroyed to a greater or less extent." By its date this testimony effectively disposes of the claim, often ad-vanced, that the reservoirs and dams of southwestern

Colorado are relics of the early days of the cattle in-dustry. Norden-skiöld also mentioned ditches: "Traces of a ditch (on Chapin's Mesa) ... have been ob-served north of the reservoir by Richard Wetherill."

¹³ Prudden, 1918.

¹⁴ Fewkes, perhaps more than anyone, knew how numerous and extensive these prehistoric reservoirs were, but economic problems held little interest for him. In his "Prehistoric Villages, Castles, and Towers

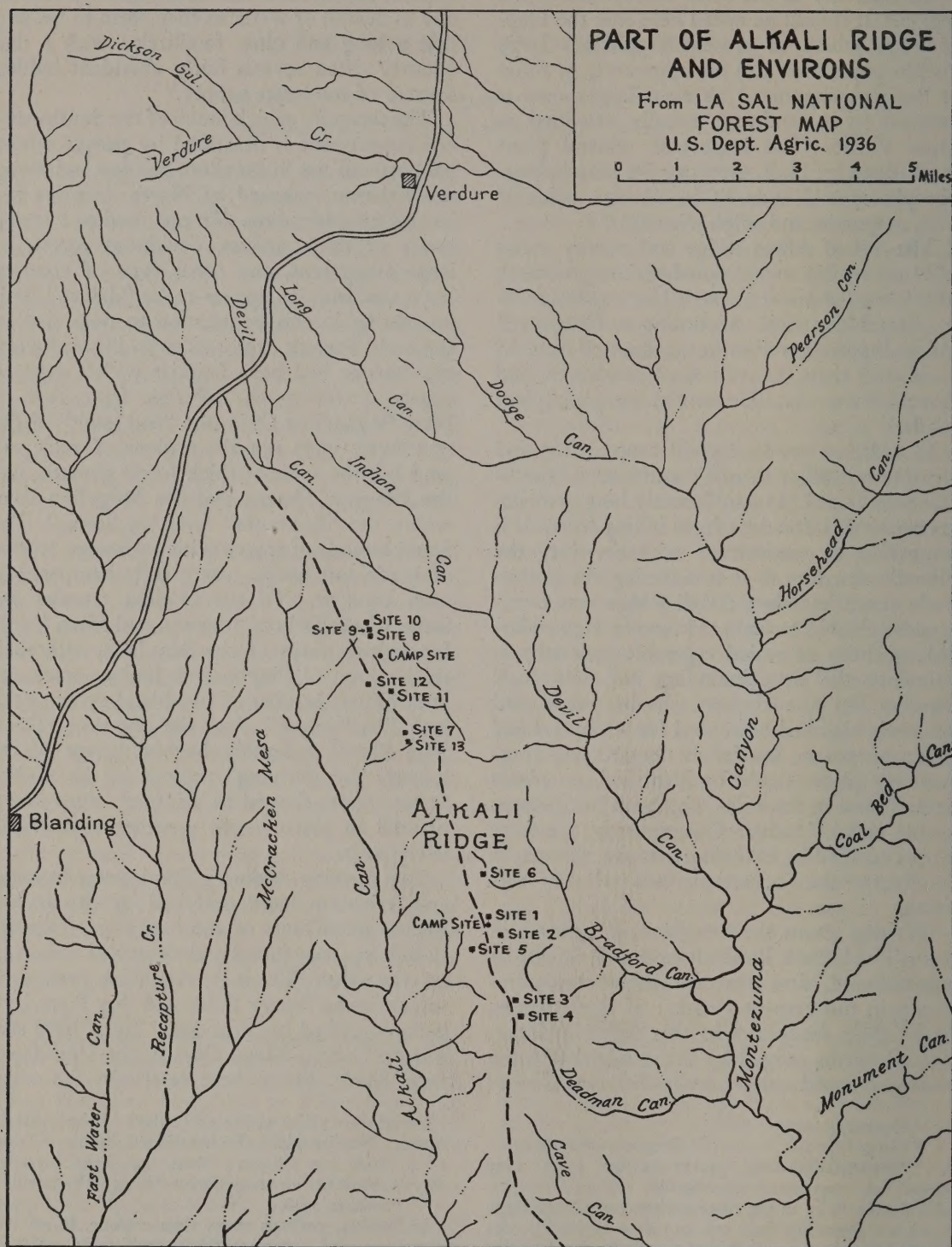


FIG. 1. Part of Alkali Ridge and environs in southeastern Utah.



FIG. 2. Part of the Pueblo area in the southwestern United States, showing the location of Alkali Ridge.

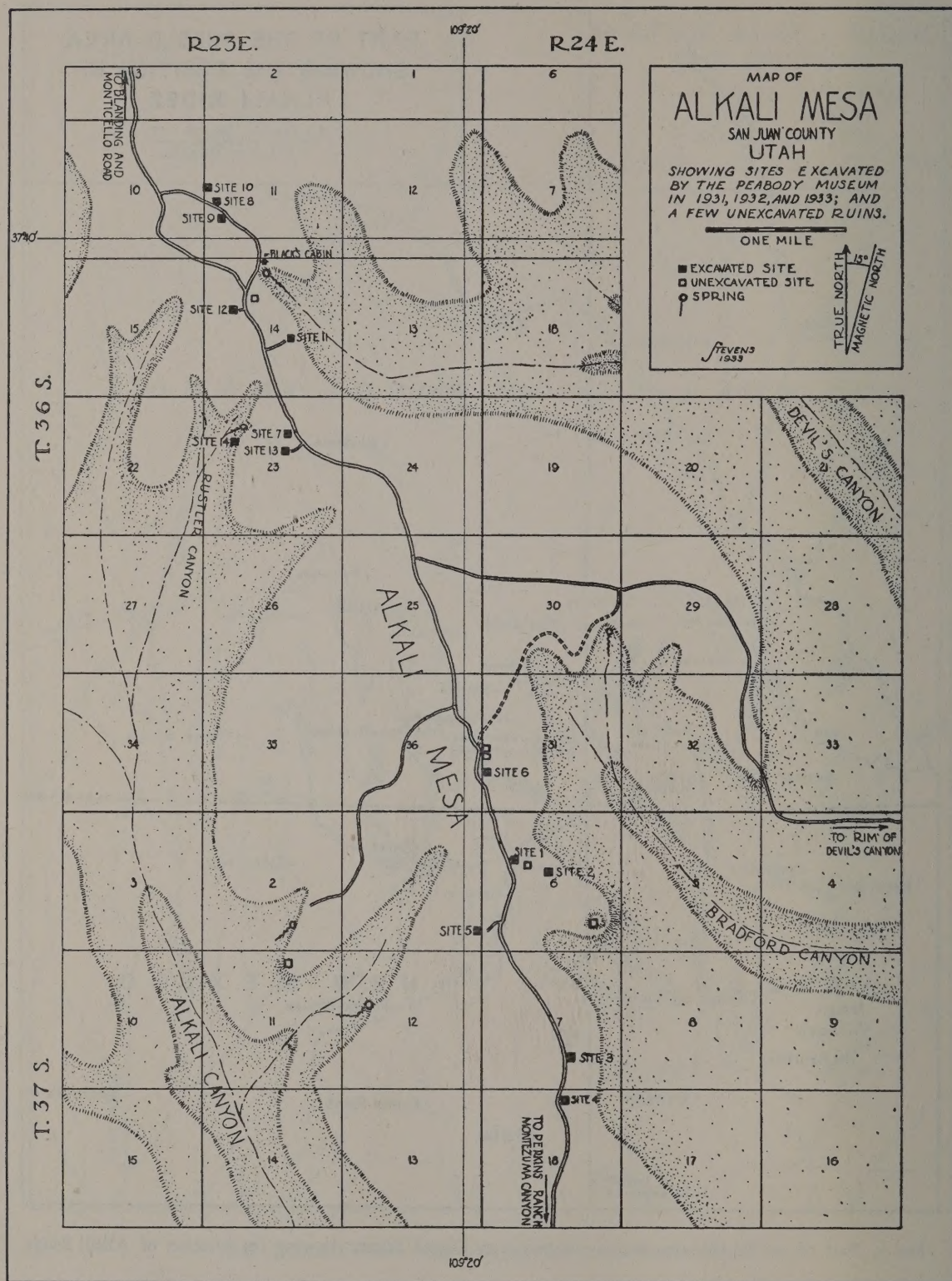


FIG. 3. Location of sites on Alkali Ridge excavated by the Peabody Museum Southeastern Utah Expedition.

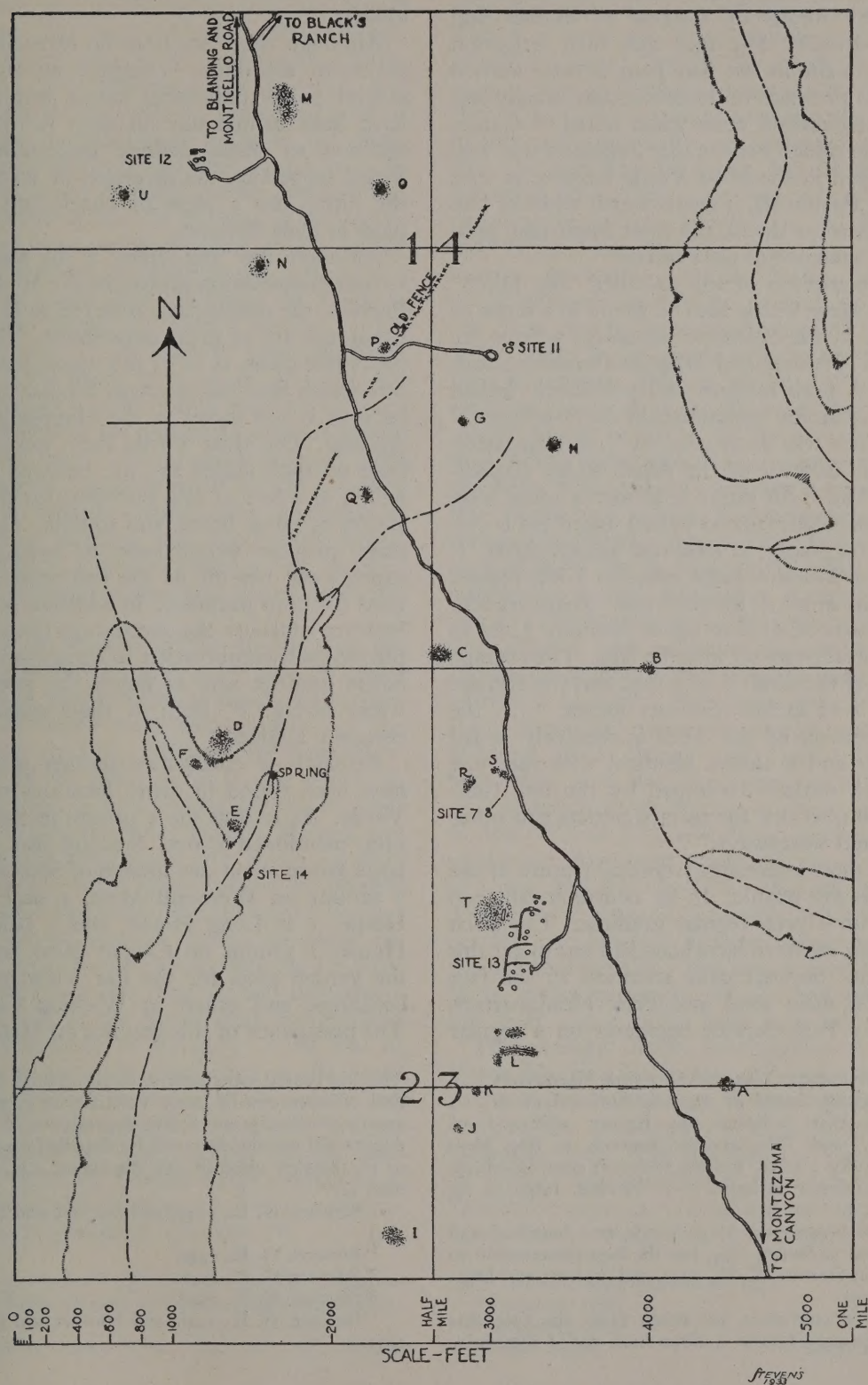


FIG. 4. Map of part of Alkali Ridge, showing the frequency of archaeological sites. Excavated Sites 7, 11, 12, and 13 are shown. Site 14 is a small cave site containing material from the Pueblo I, I, and III periods in the Pecos Classification.

seems to have been led to the fields and garden plots by means of systems of ditches and check-dams.¹⁵ The fact that such irrigation systems exist in the San Juan is little known and the presence of reservoirs has usually not been emphasized even when noted.¹⁶ Consequently, since I believe that irrigation was well developed in the Mesa Verde Region, at least during Pueblo III, it seems worth while to cite here, in some detail, the most important published reference to the practice.

A description of the so-called "Big Ditch" on the Mesa Verde is to be found in a series of articles in the *Scientific Monthly*, written by Guy R. Stewart and Maurice Donnelly, dealing with both modern and prehistoric Indian water economy techniques in the Southwest.¹⁷ The ditch was discovered by J. A. Lancaster, assistant director of the Alkali Ridge Expedition. The main ditch is almost 4 miles long (approximately 20,000 yards) and there is evidence suggesting at least one branch ditch. It begins at Mummy Lake, near Far View House, and runs south down the mesa. There are also indications of ditches above Mummy Lake to feed surface run-off into the lake. The average width of the ditch is 30.5 feet, and the average depth is 11 inches. Stewart writes, "... the cross section of the ditch is relatively broad and flat and is almost identical with the type of ditch outline developed by the Soil Conservation Service for terrace outlets and other vegetated waterways."¹⁸

The most impressive technical feature of the ditch is the profile. In its course it falls 700 feet with a very regular gradient. The ditch certainly seems to have been laid out to get this gradient. Stewart calls attention to the fact that the main road into Park Headquarters, built by Park Service engineers on a regular

gradient, follows the course of the ditch very closely.

Although there has been no extensive excavation of the ditch, "evidence was found at several points indicating where water might have been turned out on corn fields."¹⁹ In addition to these, definite indications were found suggesting the diversion of water from the ditch into 2 areas of check-dam garden plots in Soda Canyon.

Although the "Big Ditch" is the most spectacular conservation project of the Mesa Verde Pueblos, the check-dams referred to in the last paragraph are of great importance. These are successive dams, 10 to 15 feet apart, across run-offs which feed the canyons. Similar dams can be seen in use today in the Hopi country in Arizona. On Mesa Verde they were usually built on rock ledges and are believed to have held 3 to 4 feet of soil, sufficient for the cultivation of corn, beans, and squash. Their primary purpose would seem to have been to capture the run-off of the torrential summer rains for crop purposes. In addition, however, Stewart advances the interesting theory "that planned soil conservation to retain soil for the house gardens was as much the purpose as water saving."²⁰ Both of these results were certainly attained.

Remains of check-dam garden plots have now been found in many locations on Mesa Verde. As well as the 2 groups in Soda Canyon, mentioned above, Stewart lists another large group on an east branch of Soda Canyon; 3 groups on Wetherill Mesa, 1 near Kodak House, 1 at Long House, and 1 below Jug House; 2 groups on Chapin Mesa providing the garden plots for the Far View group of buildings; and others in Wickiup Canyon.²¹ The prevalence of this practice on Mesa Verde

of Southwestern Colorado" he writes, "Reservoirs . . . are generally found in the neighborhood of all . . . mounds that indicate the former existence of pueblos," and "The ancient reservoir at Bug Mesa covers fully 4 acres, and the reservoir near Goodman Point is almost as large. . . ." Fewkes, 1919a, p. 64, plate 32, a.

¹⁵ Check-dams on Mesa Verde are described and illustrated in Sweet, 1924, but the best presentation to date is in Stewart, G. R., 1940, and Stewart and Donnelly, 1943.

¹⁶ Some confusion has arisen from the fact that kiva depressions have at times been called reservoirs.

This has caused some later students to infer that mention of reservoirs by early writers was invariably an erroneous description of kiva depressions. If any such doubts still remain, they will be dispelled by reference to the reports cited in this discussion, e.g., cf. footnote 14.

¹⁷ Stewart, G. R., 1940, and Stewart and Donnelly, 1943.

¹⁸ Stewart, G. R., 1940.

¹⁹ Stewart, G. R., 1940.

²⁰ Stewart, G. R., 1940.

²¹ Stewart, G. R., 1940, and Stewart and Donnelly, 1943.

suggests the advisability of a thorough search for similar remains throughout the San Juan.²²

Because they have not been sufficiently emphasized previously in the anthropological literature, I have presented the irrigation and check-dam techniques first. However, most of the crops in prehistoric times in the Mesa Verde area seem to have been raised by ordinary flood-water farming and by dry farming.

It is probable that the Pueblos of the region practised flood-water farming in the valley bottoms as they do today in the parts of the Southwest where they still reside. H. E. Gregory, Kirk Bryan, C. Daryll Forde, J. W. Hoover, and J. T. Hack²³ have described Pueblo flood-water farming in detail, and a large acreage of such farm land would have been available to the prehistoric agriculturalists in the San Juan. The torrential showers, with rapid run-off, characteristic of the country present a situation particularly adaptable to flood-water farming and flood-water irrigation, which is a simple diversion and distribution of the water as the flood comes down the valley.

Today the streams of the region, with the exception of the San Juan itself, are of a nature classified as intermittent. Water flows in them only after heavy rains which come, for the most part, in July, August, and September. The soil on the valley floors as well as that on the mesa-tops is rich. Although the canyons cut through the overlying Dakota, Mancos, and Mesa Verde formations into rocks beneath, which have a much lower content of mineral plant food, still much of the alluvium is washed in from above. Even in regions composed entirely of rocks poor in plant food, the alluvium of the valleys is relatively richer, apparently, than the soils on the higher lands surrounding them. According to Gregory: "The bits of plant food sparingly distributed in the rocks are accumulated in the soils of washes and alluvial fans. Here the food is stored in large quantities and for long periods, because continuous, vigorous, ground-water movement is lacking, and the leaching of soluble constituents is correspondingly checked."²⁴

Farming on the mesa-tops in the past, however, was probably, as it is today, dry farming. This is a type of agriculture in which the plants are raised largely by means of slight spring rains and residual moisture in the soil from the fall rains and the winter snows. Then in July and August they are brought to maturity, the ears are filled out, by the seasonal torrential rains. I have not been able to obtain temperature and precipitation records for Alkali Ridge, but records exist for stations nearby. At Aneth on the San Juan a record of 10 years shows an average growing season of 161 days, that is, between the date of the last killing frost in the spring and the first killing frost in autumn. Modern varieties of corn require 90 to 150 days for the maturing of full ears.²⁵ Aneth, however, on the river, is lower than Alkali Ridge and the growing season on the latter will probably average considerably less. So we turn to Mesa Verde where the differential in elevation favors Alkali Ridge. Officials of Mesa Verde National Park have been conducting a very interesting experiment, in part as a demonstration for the benefit of skeptical tourists who refuse to believe that the Indians could have grown crops "at such a high altitude." In 1928 2 acres were fenced off on the mesa-top and maize was planted, seed being obtained from Navajo and Pueblo Indians. Since then corn has been raised annually. In 1935 a report of the experiment was published in *Mesa Verde Notes*.²⁶ From 1928 through 1934 good crops were raised with the exception of 1 year, and then the failure was only partial. The yield compared favorably with that in nearby dry farming districts where corn is raised commercially. The ears ranged from 7 to 10 inches in length. In the bad year the ears were 3 to 5 inches long, poor but usable.

The average annual precipitation at Mesa Verde National Park was 17.7 inches for the 10 years previous to 1933.²⁷ The annual peak came in July or August; the driest month was invariably June. The snowfall for the winter of 1930-31 was 46.0 inches; for 1931-32, 98.1 inches; for 1932-33, 71.6 inches; and for 1933-34, the lowest on record, 29.2 inches.

²² See p. 18, for early note on possible irrigation ditches at Surouaro ruin near Yellowjacket Post Office, Colorado.

²³ Gregory, 1916; Bryan, 1929 and 1941; Forde,

1931; Hoover, 1930; and Hack, 1941.

²⁴ Gregory, 1916.

²⁵ Gregory, 1916.

²⁶ Cline, 1935b.

²⁷ Watson, 1934.

The Alkali Ridge Sites, 8, 9, 10, 11, and 12 are situated in the vicinity of fields cultivated at present with a dry farming technique²⁸ by Mormon ranchers from Blanding, and it is highly probable that in prehistoric times much of the mesa-top was under cultivation as well as the floors of the nearby canyons. A large quantity of maize was found in the sites, a considerable amount of beans, and a few charred fragments of squash rind.

Nearer to Alkali Ridge, precipitation and temperature records exist for Blanding, Monticello, and Bluff, all in San Juan County, Utah.²⁹ Blanding is situated only about 8 miles from Site 1 on Alkali Ridge in an air line, slightly north of west (fig. 1). Bluff lies to the southwest on the river and Monticello, the county seat, to the northeast on the eastern slope of the Blue Mountains. The altitude at Blanding is 6,400 feet, within the altitude range of the Alkali Ridge sites; Bluff, on the San Juan, is much lower, 4,200; and Monticello is higher, 7,400. The figures for Blanding should be applicable to the environs of our Alkali Ridge sites. A 30-year record, 1905 to 1934, shows a mean annual precipitation of 14.94 inches with a range of 7.07 to 24.61. This is well above the San Juan County mean which is in turn well above the means for other southern Utah counties. The annual range is wide but less than in the Navajo country to the south and also less than in the plateau country across the Colorado River to the west.

Much less rain falls in Bluff, with an average mean for 14 years of 6.91 inches, range 3.63 to 12.72. Monticello, however, is slightly higher, with a mean of 16.72, range 8.21 to 24.19. The northern part of the region investigated on Alkali Ridge, the vicinity of Sites 9 to 13, probably falls in between the Blanding and Monticello figures.

As at Mesa Verde, June is the driest month. Means for June for the periods cited above are: for Blanding, .44 inch; for Monticello, .70; and for Bluff, .25. May is next driest, and then, at Blanding and Monticello, April. On the other hand, July is wetter than average at Blanding and Monticello, and August is wetter than that. In fact the highest monthly mean at

Monticello is in August. In other words, the precipitation ordinarily meets the requirements for dry farming.

The temperature and frost situation also permits dry farming in the part of San Juan County with which we are primarily concerned. The U. S. Weather Bureau gives the average period free from killing frosts for Blanding as 145 days and for Monticello, which is higher in altitude than any of the Alkali Ridge sites, as 128 days.³⁰

Summer temperatures are moderate, rarely reaching 90 degrees Fahrenheit at Monticello (where the highest recorded temperature is 98 degrees) and rarely exceeding 95 degrees at Blanding. In the winter below-zero readings are recorded from all stations, even on the San Juan. The soil is frozen from 1 to 4 feet, and the Colorado and San Juan freeze over in places, sometimes hard enough to support wagons. The annual ranges are great: 119 degrees at Monticello, from 98 degrees to -21 degrees; and 133 degrees at Blanding, from 110 degrees to -23 degrees. Daily range, except at the bottoms of canyons, is 40 degrees to 50 degrees. Summer nights are cool, and summer thunder storms often lower the daytime temperature abruptly.

Besides the cultivated plants, wild varieties also provided food supply. Pinyon nuts were found in the Alkali Ridge sites, and charred remains of prickly pears. Many other wild seeds, roots, leaves, and flowers were probably eaten. In addition, the bones of the following animals were found in the sites. The identifications were made by Professor Glover M. Allen.

MAMMALS

- Dog, *Canis familiaris*
- Coyote, *Canis latrans* (? subspecies)
- Wolf, *Canis lycaon* (probably *baileyi*)
- Berlandier's Badger, *Taxidea taxus berlandieri*
- Bobcat, *Lynx rufus* (? subspecies)
- Texas Jack Rabbit, *Lepus californicus texianus*
- Western Cottontail Rabbit, *Sylvilagus auduboni warreni*
- Pocket Gopher, *Thomomys* (? sp.)
- Yellow-haired Porcupine, *Erethizon epixanthum*
- Rocky Mountain Mule Deer, *Odocoileus hemionus macrotis*

1938, p. 35.

²⁹ Gregory, 1938, p. 18.

³⁰ Gregory, 1938, p. 20.

²⁸ Professor Merrill of Utah Agricultural College is quoted as saying, "Without question San Juan ranks as the best dry farming county in the State." Gregory,

Wapiti or Elk, *Cervus canadensis*
 Mountain Sheep, *Ovis canadensis*
 Mountain Lion, *Felis oregonensis* (sp.)

BIRDS

Eastern Turkey, *Meleagris gallopavo silvestris*
 Golden Eagle, *Aquila chrysaetos canadensis*
 Western Red-tailed Hawk, *Buteo borealis calurus*
 Turkey Buzzard, *Cathartes aura septentrionalis*
 Barred Owl, *Strix nebulosa*

Professor Allen notes that the identification of some subspecies rests partly on color and so can not be added in identification based on hard parts only.

Other animals now found in the region are bear, western fox, weasel, skunk, chipmunk, squirrel, prairie dog, rats, mice, and bats, and it is probable that they were present during the Pueblo occupancy. Muskrats and beavers still live along the San Juan River and otters on the Colorado. Evidence found in other sites in this part of the San Juan shows that antelope and mink were also in the country at that time. Toads, frogs, lizards, mud turtles, and snakes, including the rattlesnake, bullsnake, and racer are now found. In addition to the birds on Professor Allen's list, the modern fauna includes jays, blackbirds, crows, magpies, orioles, swallows, finches, mourning doves, bluebirds, sage thrashers, meadow larks, ravens, swifts, sapsuckers, grouse, catbirds, cranes, quails, flycatchers, chickadees, hummingbirds, woodpeckers, wrens, and various transitory water-fowls. D. D. Brand has published an extensive list of mammals, birds, reptiles, and insects found in Chaco Canyon, one of the southern tributaries of the San Juan in northwestern New Mexico.³¹ Most, if not all, of those listed probably live north of the river as well.

Dwight W. Rife, M.D., has published an article in *Mesa Verde Notes* in which he gives the opinion that the prehistoric Pueblo inhabitants of the region had a fairly well-balanced diet. He defines a well-balanced diet, according to present knowledge, as consisting of carbohydrates, proteins, fats, mineral salts, the vitamins, and water. He concludes: "There is no reason to believe that the ancient inhabitants of this area suffered from a restricted diet

which did not contain these necessary elements, except perhaps temporarily in times of stress or shortage of food."³²

On the other hand, after studying the skeletons excavated by the Alkali Ridge Expedition, Dr. Brues came to the conclusion that the population represented by those burials had suffered from malnutrition (see Appendix, pp. 328-29).

Rife goes on to list the probable sources of the various necessary elements in the diet. Many of these sources have been established by findings in the ruins; particularly in the numerous dry caves of the region where vegetable material is preserved, uncharred, in dried form. In addition to the 3 cultivated staples and edible gourds, he lists fruit of the yucca and possibly a paste of its seeds; pinyon nuts; bulbs of the Sago (Mariposa) lily; various berries, roots, and shoots; and seeds of certain grasses. Meats came from hunting wild game which contains a good supply of mineral salts and, in the later periods, at least, from the domestic turkey. Sugars probably were obtained from wild honey, sweet saps, wild fruits, and the thin syrupy juice of the ripe yucca.³³

Alkali Ridge lies in the Upper Sonoran life zone according to the classification of climate most generally used in the Southwest.³⁴ As defined by Bryan and Castetter, this zone occurs between altitudes of 4,500 and 7,500 feet, is semiarid but has enough rain for good grass although not enough for ordinary agriculture. It is well adapted to dry farming, flood-water farming, and irrigation. It provides all-year or winter range for sheep and cattle.

The landscape is characterized by small evergreen trees, pinyon and juniper, and sagebrush.³⁵ The sage, only 2 to 3 feet in height on the mesa-tops, is often taller than a man in the canyon bottoms. Cottonwood trees are found in the canyons as well as wild cherries, currants, and service berries. In the upper part of the zone yellow pines and Douglas firs are encountered.

Yellow pines are now standing within 2 miles to the north of Site 9. Farther up, toward the Blue Mountains, scrub oak, spruce, Douglas fir, balsam, quaking-aspen, and other trees

³¹ Brand, Hawley, Hibben, *et al.*, 1937, pp. 47-49.

³² Rife, 1931.

³³ Rife, 1931.

³⁴ Hack, 1941; Castetter, 1936.

³⁵ For illustration of the vegetation, see figs. 81, 82, 83, 86, d, 88, c, 90, and 91.

occur.³⁶ Chester Biesen has published descriptions of the evergreens in Mesa Verde National Park. The larger evergreens now found growing there are: pinyon (*Pinus edulis* — Engelm.); western yellow pine or rock pine (*Pinus ponderosa*, var. *scopulorum* — Engelm.); 3 junipers, Utah or desert juniper (*Juniperus utahensis* — Engelm.), *Juniperus monosperma* — Engelm., and Rocky Mountain red cedar (*Juniperus scopulorum* — Sarg.); and the tree variously labeled Douglas fir, Douglas spruce, or false hemlock (*Pseudotsuga taxifolia* — [Poir] Britt., *Pseudotsuga mucronota* — Raf.). Concerning the Douglas fir, Biesen says, "There has been perhaps more confusion regarding the classification of this tree than any other evergreen. Called both a fir and a spruce,

³⁶ In Gregory, 1938, pp. 23-26, are listed 345 plants found in San Juan County from 4,000 feet on the

it is neither, and yet possesses some similarity to each."³⁷ Unfortunately, as will develop presently in this report, our archaeology is beset with classificatory difficulties much more serious, for us, than this one.

The picture presented then, of the section of the San Juan drainage which we are studying, is of a country relatively rich in comparison with much of the Southwest. There is today a large and varied flora and fauna, good soil, and a considerable water supply. As far as our evidence shows, similar conditions prevailed there in prehistoric times during the occupancy of the sites we excavated. Except for the very occasional periods of extended drought, recorded in the tree-rings, it seems to have been an excellent country for Pueblo farmers.

Colorado River to 10,000 feet in the Abajos.

³⁷ Biesen, 1938.

THE HISTORY AND EXTENT OF MESA VERDE ARCHAEOLOGY

When my son was born I thought that he had come into a world where everything worth doing had been done, where the springs of opportunity had all dried up. Now, on the twenty-first anniversary of that day, I can tell him that never before in the history of the world has opportunity been so great — for we are just beginning to find out how much we do not know.

— LINCOLN STEFFENS

UPON beginning my studies in American archaeology, I was told by some that the Southwest had been "done" and that, if I were wise, I should select a field wherein more problems were to be found. When I disregarded this advice and persisted in the Southwest, I was told that the San Juan, particularly the Mesa Verde division of the San Juan, had been "exhausted" and that I should seek an area wherein the cultural development was not completely known. Dr. Kidder and Mr. Guernsey told a different story, but this, I believe, was generally set down to modesty. With their encouragement I again persisted and, after 10 years, feel that I have reached the position of the author quoted above.

The prehistory of any region or people of the earth as presented at a given time is a reconstruction. The reconstruction is produced in the mind of the writer or lecturer by means of analysis of evidence gathered, interpreted in terms of the learned disciplines he has at his disposal. When he has personally conducted field work in the region, part of that evidence is the result of his own excavations and observations. However, in most parts of the world the study of archaeology has progressed so far that the bulk of his information is to be found in the works of former and contemporary investigators.

Such works may be divided into 2 kinds: collections of materials in the form of artifacts; and collections of observations and theories in the form of manuscripts and maps, published or in archives, as the case may be. Continual careful re-examination of both is important. New ideas often result from resurveys of old material and from comparisons of previous work with recent discoveries. Furthermore, a knowledge of the steps by which current concepts have been built up is essential to an understanding of these concepts.

Consequently, it seems wise at this time to review briefly those activities of early and contemporary investigators which bear upon the problems of this report. The review will consist of 4 parts: (1) the history of Mesa Verde archaeology as a field of scientific investigation, pages 15-31; (2) the history of the development of present cultural classifications, particularly the formalized Basket Maker-Pueblo cultural sequence, pages 32-43; (3) the physical anthropology of the Southwest, pages 67-73; and (4) the present situation, pages 74-85.

Alkali Ridge lies in the middle reaches of the San Juan. In the following pages I shall list the works bearing on the archaeology of the Mesa Verde area. For the purposes of this discussion, the Mesa Verde area will be considered to include the northern drainage of the San Juan River in southwestern Colorado and southeastern Utah, from the San Juan Mountains to the Colorado River. Part of the Dolores River drainage in southwestern Colorado will also be included. As we follow the development of archaeological knowledge, it will be necessary to cite, as well, certain works pertaining to neighboring regions or to the Southwest as a whole, because of their importance in relation to our problems in the San Juan.

The researches of the last 25 years have been profoundly influenced by the formalized concept of Basket Maker-Pueblo cultural sequence, particularly since the famous revision of it in 1927 which is known as the Pecos Classification. Many students have assumed that this concept grew out of a large amount of evidence — the result of a great number of excavations. The assumption is, I believe, erroneous. Furthermore, most of that excavation is supposed to have been concentrated in the San Juan, and the statement has been and still is generally made that the San Juan has been

sufficiently explored. Such is definitely not the case. The following summary will expose the error of this almost ludicrously inaccurate supposition. In the first section of the review, which is this present chapter, I shall show among other things that (1) the number of sites dug is small; (2) the size of most archaeological operations has been small; and (3) a large part of the work done, although it has prepared the ground in one way or another, has not given us the chronological data or analyzed data which is necessary for the reconstruction of a satisfactory story of cultural development.

At the same time I shall attempt to evaluate each expedition fairly and give full emphasis to the useful aspects of its accomplishments, and it is necessary to remember that much of this work was done before the development of modern techniques of excavation, analysis, and orderly presentation. Consequently, comments on limited usefulness are, for the most part, not adverse criticisms of early students in the field, because the limitations were often beyond their control. In fact, some of the early work, particularly the Hayden Survey in the 1870's, followed the accepted or at least theoretically accepted modern procedure of extensive reconnaissance before excavation.

In order properly to emphasize the major steps in the development of the archaeology of the Mesa Verde division of the San Juan, it is convenient to divide the work done into 4 groups:

1. Up to 1885: exploration and discovery; descriptive writings; preliminary comparative studies.
2. 1885-1914: simple but extensive excavation; extended surveys.
3. 1915-27: stratigraphic excavation.
4. Since 1927: analytical studies; excavation directed toward the solution of particular problems.

This is a rough grouping but it indicates the trend. As in all systems of classification the categories overlap, the dates are but approximations, and many of the latest developments are definitely foreshadowed by the earliest writers.

¹ Dominguez and Escalante, 1854 (1777).

² Fewkes, 1917c.

The first known literary reference to an archaeological site in the Mesa Verde area is in the journal of Escalante,¹ written in 1776, 236 years after the coming of Coronado to New Mexico. In that year, which marked the birth of the United States on the Atlantic seaboard, Fray Francisco Atanacio Dominguez and Fray Silvester Velez Escalante² with a party of 8 other men started from Santa Fe to work out a direct route from the New Mexican capital to the new Spanish settlement of Monterey in Upper California. They proceeded up the Rio Grande and the Chama, crossed the San Juan, and went down the Dolores for a considerable distance before turning up over the Uncompahgre Plateau to the Gunnison River.

Although most previous Spanish exploration had been in other directions, in regions of occupied Pueblo towns or important routes of commerce, it is probable that occasional travelers in search of gold or souls had looked upon the ruins of the San Juan before Escalante. Bolton says of the route as far as the Gunnison, "to here they were in known country."³ Escalante's guide and interpreter to the Utes was Andres Muniz of Bernalillo who had been a member of the Rivera Expedition of 1765.⁴ The journal of the Rivera Expedition is lost but the evidence seems good that it penetrated well into the San Juan country, and the naming of the Dolores River is accredited to Rivera. However, since none of his predecessors left known written mention of the ruins, Escalante must be listed as the first archaeological recorder.

The Escalante journal mentions particularly a ruin near the big bend in the Dolores, west of the modern town of that name. The region, in common with most of the Southwest, is liberally supplied with ruins, and there is some doubt as to the one intended. The ruin Fewkes believed to be the one referred to, which he called the Escalante ruin, is "situated about 3 miles from Dolores (town) on top of a low hill to the right of the Monticello (Dove Creek) Road, just beyond where it diverges from the road to Cortez. The outline of the pile of stones suggests a D-shaped or semicircular house with a central depression surrounded by rooms separated by radiating partitions."⁵

³ Bolton, 1928, p. 42.

⁵ Fewkes, 1919a.

⁴ Hill, 1921.

Escalante's record presents an interesting early historical note but, obviously, gives us no useful evidence of the development of prehistoric cultures.

For 100 years after Escalante little attention was given to the region and less to its ruins. Trappers, traders, Mormon explorers, prospectors, and a few cattlemen passed through occasionally or camped for a while. The traders of the early nineteenth century for the most part left no notes or journals. In fact, they were often more interested in concealing than in revealing their movements. There is a published account⁶ of a trip by a party of Mexican traders from Santa Fe in the early 1830's led by Antonio Armijo. They crossed the San Juan following the Escalante route. Ewing Young is said to have followed this route in the same year, meeting Ogden's party in Utah.⁷ The following year Young again visited the San Juan country with William Rolfskill and J. J. Warner. The only account of that trip was written by the last-named some 50 years later.⁸

The discovery of gold in California was, perhaps, of greater importance to the Southwest than the *entrada* of Coronado, for it brought people in great numbers from the American States in the Middle West and along the East coast. The '40ers crossed by a number of routes, one of which was the "Old Spanish Trail" through the San Juan.

Mormon exploration of what was later to become the San Juan Stake of Zion and San Juan County of Utah began in the early '50's. The most noteworthy of these efforts, from an archaeological point of view, was the party led by William D. Huntington. This party followed the Gunnison trail from Salt Lake City to the Grand (Colorado) River. Huntington's description⁹ indicates that they came south through the present Moab region, down Montezuma or Recapture Creek to the San Juan, turned east, and ascended the McElmo, where they explored ruined houses and towers in a side canyon, presumably one of the Hovenweep group. In addition to the large standing buildings, Huntington describes ordinary sites in the open, reduced to heaps of crumpled

walls, and cave houses with "red cedar" joists still in place. The descriptions are quite detailed and measurements are given for rooms, walls, and doorways.

Again, these early nineteenth-century explorations provide us with little useful scientific information, and no excavations were made. Their value is merely that of gradually directing attention to the fact that ruins were to be found in the region. Because of them the expeditions about to be described, although organized for other purposes, expected to find prehistoric sites and in some cases made staff preparations to study and describe them.

There were, in all, 3 important historical events in the 1840's which aided materially, though indirectly, in bringing the ruins of the San Juan to the attention of the scientific world. The Mormon migration to Utah and the California gold rush have already been mentioned. The third, chronologically between the other two, was the war between the United States and Mexico as a result of which a large part of the region we call the Southwest came into the possession of the United States.

These 3 events produced 3 types of exploration: (1) Mormon surveys for colonization; (2) official governmental exploration under the War Department and the United States Geological and Geographic Survey of the Territories; and (3) railroad surveys arising from the need of better communications with rapidly growing districts on the West coast. The last two were of especial importance to archaeology, because they brought into the country trained scientific observers with equipment for the making of accurate records.

The first of the official explorations which was of importance archaeologically missed that part of the San Juan with which we are most concerned in this report. On August 16, 1849, a military expedition against the Navajo Indians left Santa Fe under the command of Brevet Lieutenant-Colonel John M. Washington, then governor of the territory of New Mexico. On his staff was James H. Simpson, A.M., First Lieutenant, Corps of Topographical Engineers. Simpson's report,¹⁰ although he did not visit the Mesa Verde region, merits consideration

⁶ Bulletin de la Société de Géographie, 1835, ser. 2, vol 3, pp. 316-323.

⁷ Hill, 1921, p. 467.

⁸ Dodge, MS.

⁹ Huntington, 1854, reference by courtesy of John Everett Dodge.

¹⁰ Simpson, 1850.

here, because he described the main ruins in Chaco Canyon and Canyon de Chelly, belonging respectively to the other 2 major cultural divisions of the San Juan drainage. He also included descriptions of Santo Domingo and Jemez pueblos, with important architectural details and colored illustrations of 5 wall paintings in contemporary Jemez kivas.

The first official exploration of the Mesa Verde region was in 1859 by the party under Captain J. N. Macomb,¹¹ also of the Topographical Engineers. With him was Professor J. S. Newberry,¹² geologist, who described the geology of much of the region with which we have to deal and mentioned many of the ruins. Much of the report, including Newberry's section, was written in 1860, but because of the Civil War, it was not published until 1876. The route of the expedition was up the Chama River from the Rio Grande; through Pagosa Springs; across the Piné, Piedra, and Animas rivers; around the south base of the La Plata Mountains to the Dolores River; and across the Great Sage Plain to the junction of the Grand and the Green Colorados. The return trip proceeded southward from the La Sal Mountains; passed the site of Monticello, the present county seat of San Juan County, Utah; continued south, close to Alkali Ridge, to the San Juan River; and then went up the San Juan to Canyon Largo and across to Jemez, Santo Domingo, and Santa Fe.

Macomb, in his section of the report, noted that the architectural remains and the pottery suggested that the San Juan Valley "was once occupied by a race probably of the same origin and character as the Pueblo Indians extant in New Mexico." This is important because the Mormon reports had received scant notice and the general belief was that Chaco Canyon marked the northernmost extension of the Pueblo cultures. Even though the publication of Macomb's report was delayed for 16 years, knowledge of his findings was current in Washington, and subsequent expeditions were prepared to find important archaeological remains.

Newberry's accompanying geological report describes Aztec ruin on the Animas. He

noted the great profusion of ruins in the country lying between the Mancos and the Dolores but did not discover the cliff houses of the Mesa Verde. He gives another description of what seems to be the famous Escalante ruin and mentions ruins in the cliffs of the Dolores. Traveling west from the Dolores, the expedition passed Surouaro ruin near the present Yellowjacket Post Office in Montezuma County, Colorado. This is one of the largest collections of buildings in the Mesa Verde area. It has been "pot-hunted" extensively, but no part of it has been excavated scientifically. Newberry mentions traces of irrigation ditches which he observed.¹³ His report at this point embodies a mistake generally made by casual visitors from the East but rather surprising from the pen of a famous geologist. He describes the country about Surouaro as "hopelessly sterile." At present the ruin is at the boundary between the Montezuma Valley irrigated lands and the dry farming country. It is surrounded on all sides by extensive, fertile fields, much as it probably was during the period of its prehistoric occupancy.

Despite the activity listed above, to most people the Mesa Verde region was still unknown and during the 1860's it was the general belief that no ruins of importance existed north of Chaco Canyon, in northwestern New Mexico. It remained for the F. V. Hayden party of the United States Geological and Geographical Survey of the Territories to bring the northern ruins before the general public. The archaeological studies of W. H. Jackson¹⁴ and W. H. Holmes,¹⁵ members of that party, are of an excellence unequaled for many decades except by Nordenskiöld's later report on a restricted section of the Mesa Verde itself.

Reports of extensive silver and gold sources in the mountains of southwestern Colorado by "Baker's party" of prospectors in 1860-61 and the discovery and working of the "Little Giant" mine 10 years later induced the United States Government in 1873 to purchase from the Ute Indians a large tract of land in the "San Juan country" supposed to contain the metalliferous lodes.¹⁶

¹¹ Macomb, 1876.

¹² Newberry, 1876.

¹³ See pp. 10-11, for discussion of prehistoric irrigation in the Mesa Verde region.

¹⁴ Jackson, 1876, 1878.

¹⁵ Holmes, 1878.

¹⁶ Hayden, 1876, p. 10.

With one of their main objects the investigation of these lodes, the Hayden Survey came into the San Juan from headquarters at Denver and worked down from the headwaters in the mountains toward the Colorado River in 1874, 1875, and 1876. Description of ruins begins with the canyon of the Mancos in the Mesa Verde proper. The Aztec Springs ruin, now called Yucca House National Monument, between Mesa Verde and Ute Mountain, then called Sierra El Late, and sites in the McElmo and the Yellowjacket were also visited during the first season.¹⁷

During the second and third seasons of the Hayden Survey in the San Juan, W. H. Holmes, official geologist, was given the additional assignment of examining prehistoric remains in the districts he surveyed. Jackson's "photographic and naturalist's division" continued in the field so that 2 parties were giving attention to the ruins during 1875 and 1876. Holmes visited sites on the Rio Dolores; the Rio La Plata; Rio San Juan, between the mouth of the La Plata and the Mancos; the lower Mancos, not touched by Jackson in 1874; and revisited the upper Mancos, *Aztec Springs*, the upper McElmo, and the Yellowjacket. With the instruments at his command he was able to make accurate maps of many of the ruins. He also described and illustrated several types of pottery and other artifacts.¹⁸

Jackson resumed work in the Yellowjacket,¹⁹ recorded ruins in the San Juan Canyon, below the mouth of the McElmo; in Montezuma Canyon, in the vicinity of Alkali Ridge; in Epsom Creek; and in the Chinle (called de Chelly) south of the San Juan. A map of a large part of the Southwest accompanies this report. Jackson also made detailed ground plans of the main Chaco ruins.²⁰

It is of particular interest to note that at the junction of the Yellowjacket and the McElmo and also in the valley of the Dolores both Jackson and Holmes observed slab-walled ruins²¹ of the type found at Site 13 on Alkali Ridge by the author (see pages 219-20). Although noted then, this distinctive type of ruin,

often quite large and found throughout the region, had been completely ignored by excavators with the exception of Morris until the Peabody Museum dug Site 13 in 1932 and 1933. Further discussion of this will be found on page 24.

With the Hayden Survey Mesa Verde archaeology was certainly well launched, but again it must be emphasized that there was no organized excavation—merely observation and collection. This is far from an adverse criticism, as it falls in line with the best modern procedure, that is, extensive reconnaissance before intensive excavation.

The immediate results of the archaeological observations of the Hayden Survey were by no means restricted to the papers of Jackson and Holmes. Alfred Morgan reported on the archaeological aspects of the survey to the Literary and Philosophical Society of Liverpool, and his report was published with a rather good map.²² This announcement inaugurated the interest of European archaeologists in the Mesa Verde area which culminated later in the works of Nordenskiöld. To this day the Mesa Verde is better known in the British Isles and Northern Europe than other fields north of Mexico.

Of more importance to American readers, however, were the 2 papers by E. A. Barber in the *American Naturalist*.²³ These reports are good examples of the breadth of perspective of many of the early writers. Barber was with the Hayden party, and his studies constituted the first serious attempts to describe, analyze, and classify the minor artifacts of the Mesa Verde. One paper deals with pottery, the other with stone implements and ornaments. His classifications of pottery designs and shapes included speculations about technique. It is of interest to note that he describes a paddle-and-anvil pottery-finishing technique as used by contemporaneous Utes. The paper on stone objects carefully lists the materials of which they were made, gives a functional classification of implements, and a classification of arrow-points on the basis of form. In addition there are com-

¹⁷ Jackson, 1876.

¹⁸ Holmes, 1878.

¹⁹ In both Holmes' and Jackson's reports the stream now called Yellowjacket was called Hovenweep. The present and famous Hovenweep is a tributary of the Yellowjacket.

²⁰ Jackson, 1878.

²¹ Jackson, 1878, p. 414; Holmes, 1878, pp. 385-86.

²² Morgan, 1876-77.

²³ Barber, 1876, 1877.

petent discussions of tchamahias and arrow straighteners-smoothers, both troublesome implements to modern students.

I shall comment on one other item only in the official surveys of the '70's for the purpose of emphasizing again the well-rounded and scientific character of the work of these men, so different from that of many who followed them in the ensuing half-century. In a single operation in 1874, Professor E. D. Cope foreshadowed the work of the physiographers (Bryan, Brand, Hack, etc.) and the dendrochronologists (Douglass, Haury, Hall, Hawley, McGregor, Getty, etc.). Working with the Wheeler Survey in the Gallina country in New Mexico, he became interested in the relationship of prehistoric sites and erosion conditions as a possible indicator of the age of the ruins. In his report²⁴ he states, "The only means which suggested itself at the time as available for estimating this rate (of erosion) was the calculation of the age of pine trees which grow near the base of the bluffs. . . . My assistant, an educated and exact man, counted the rings in a cut he made into the side of a piñon (*Pinus cembroides*).²⁵" The italics are mine. This is not the first instance in which Cope had been found to be 50 years ahead of his time.

Aside from the official surveys, one other paper of the '70's is worthy of note, as it appears to be the first published report of a ruin near the head of the Mancos, beyond the points reached by Jackson and Holmes in what is now Mesa Verde National Park. In 1879 W. F. Morgan presented a paper at the A. A. S. meetings in St. Louis describing, with ground plan, a small cliff house.²⁵ Whatever digging, if any, was done at this time is not reported.

The most important published work of the '80's in the Southwest, that of the Mindeleff brothers, did not reach the Mesa Verde, although it made excellent comparative use of the descriptions and photographs of Jackson and Holmes. In the same decade Holmes' study of Southwestern pottery was published.²⁶ Although long antedating petrographic analysis

and taxonomic classification, this work can still be read profitably by all students of Southwestern prehistory. However, the Mindeleff architectural studies and Holmes's ceramic descriptions were of but indirect and future value in the development of our knowledge of San Juan archaeology. For the next immediate step, one which can be argued as the most far-reaching single event in Southwestern archaeology, we must turn to a group of amateurs, who inaugurated the phase of simple but extensive excavation in the San Juan (see page 16) which lasted roughly, until 1915.

Nestled beneath the escarpment of Mesa Verde at Mancos, Colorado, was a ranch occupied by a famous family of the Southwest, the Wetherills. B. K. Wetherill was one of the first settlers in Mancos Valley,²⁷ and his sons undertook the archaeological exploration of the whole region from east of Mesa Verde to the Colorado River. There were 5 boys in all; Richard, Alfred, John, Clayton, and Wynn. While riding the range with the Wetherill cattle, they "rounded up" ruins as well, and it is easily seen that to most of them the latter were more interesting than the former.

Our great debt to them can be briefly stated. Its import will be immediately realized by the most elementary student in the field. Richard Wetherill, working in the caves of Butler Wash, Utah, in 1893, was impressed by the diversity of his finds.²⁸ Some of them were identical with ordinary "Cliff Dweller" materials; others, occurring often in isolated positions and sometimes *underneath* the "Cliff Dweller" remains, were quite different in many respects. The latter he called Basket Maker. And although T. Mitchell Prudden used the term in an article in *Harper's Monthly* for June, 1897,²⁹ Wetherill first presented the name, Basket Maker, to professional literature in a letter printed in *The Antiquarian* in September, 1897.³⁰

The first published notice of the work of the Wetherills was in 1894 in a statement in *The Archaeologist*³¹ which announced "the existence of an earlier tribe of Indians than

²⁴ Cope, 1875, pp. 166-73.

²⁵ Morgan, 1879.

²⁶ Holmes, 1886.

²⁷ Nordenskiöld, 1893, and Watson, 1941.

²⁸ Morris, 1939, p. 11.

²⁹ Prudden, 1897.

³⁰ R. Wetherill, 1897. . . . "I refer here only to the sandal of the Cliff and Mesa Dwellers, as the basket-maker made a round and a square-toed sandal with the same material, but without the offset at the little toe. . . ."

³¹ "H," 1894, p. 154.

those formerly occupying the cliff houses." Rooms were reported below the "lowest remains of the Cliff Dwellers."

The Wetherills were also active, along with Montgomery,³² in attacking the supposition, very strong at the time, that the "Cliff Dwellers" were a different people from the inhabitants of the large open sites on mesa-tops and valley-floors. Their conclusions were based upon the similarity observed not only in artifacts and architecture but also in skeletal type.

Although the influence of the work and deductions of the Wetherills has been widely felt, it has come to us mainly from the pens of others and through collections of artifacts in various museums.^{33, 34} Most of their operations have not been described in print.

Nordenskiöld's monumental work on Mesa Verde³⁵ appeared in 1893, describing field work during the summer of 1891. The report is magnificently illustrated and describes sites, associated artifacts, kiva paintings, and reservoirs of the Mesa Verde proper. It includes a description of the largest ruin on the Mesa, Cliff Palace, which had not been found by Jackson and Holmes. With true nobility Nordenskiöld gives full credit to his nonacademic associates. "The honour of discovery of these remarkable ruins belongs to Richard and Alfred Wetherill of Mancos."³⁶

At the outset Nordenskiöld exhibited technical caution which is, or should be, common practice today. Before attacking the more complicated large ruins, he conducted a "trial excavation" in a small ruin in Cliff Canyon, clearing 2 kivas and a few rooms. After this the main excavations were begun on Wetherill Mesa. One month was spent at Long House with a crew consisting of John Wetherill and

2 Mexicans. Another laborer was added for 2 weeks' work at Kodak House, so called because a camera was kept hidden in one of the rooms. And one more digger was added for 2 weeks' more excavation at Mug House and Step House, with superficial excavation at Spring House. Projected excavations at Spruce Tree House were abandoned, because of difficulty with the authorities over shipment of specimens to Sweden. During the delay thus occasioned, 2 weeks were spent in exploration, in the mapping of ruins, and in the taking of 150 photographs.

It is impossible to discover from the report, and this is a fault when judged by modern standards, how many rooms were actually cleared. Judging by the descriptions, by the size of the crew, and by the time spent, the total could not have been very great. The main value of this work lies in the excellence of presentation, the reasonably clear descriptions of the artifacts, the photographs and plans, and the general observations on physiography and ecology, important aspects of archaeological research generally ignored during the 1890's.

Other work was being carried on in the '90's and other papers were published. Many of these are of little value to the modern student, but almost all added some information about the ruins or artifacts of the region. F. H. Chapin published an article³⁷ on Mancos Canyon ruins in 1890, after a trip with the Wetherills, and produced a longer, popular account 2 years later.³⁸ W. R. Birdsall wrote on the same subject, after visiting Nordenskiöld's excavations.³⁹ His article appears twice without change.⁴⁰ In 1893 T. G. King published an account of cliff houses northwest of Bluff City,

³² Montgomery, 1894.

³³ The Wetherill Collection in the Pennsylvania Museum is especially fine.

³⁴ In justice to the Wetherills it seems desirable to reprint the following statement from Morris and Burgh, 1941, p. 1. "The large and important collection from Mesa Verde, owned by the Colorado State Historical Society, was exhumed by the Wetherill brothers in 1891 and 1892. The fact that the individual components of it are listed only as from Mesa Verde, with no reference to specific sites, calls for a word of comment, since its most obvious interpretation would be disparaging to the Wetherills. When the collections were turned in, they were documented in reason-

able detail. Later, but now long ago, they were separated into groups such as pottery, basketry, stone, etc., and recatalogued in the Historical Museum in Denver with the numbers they now bear. The original catalogues were either destroyed or so carefully tucked away that rigorous search in recent years has failed to disclose them."

³⁵ Nordenskiöld, 1893.

³⁶ For accounts of the discovery of Cliff Palace by Richard Wetherill in December, 1888, see Harrison, 1937, and Watson, 1941.

³⁷ Chapin, 1890.

³⁸ Nordenskiöld, 1893.

⁴⁰ Birdsall, 1891-92.

³⁹ Chapin, 1892.

Utah, and ruins on the San Juan between Bluff and the Colorado River,⁴¹ but no specific locations and few descriptive details are given. In 1894 McLoyd and Graham⁴² of Durango, Colorado, published a catalogue of a collection of "relics" offered for sale.⁴³ The collection had been made in southeastern Utah, mostly in Grand Gulch, and it is now in the Museum of the American Indian, Heye Foundation, in New York City.⁴⁴ The catalogue is merely a description of the artifacts. In 1897 L. W. Gunckel wrote on sites and pictographs in the canyons of the McElmo and the Hovenweep.⁴⁵ In the next year S. D. Peet published an account of the Mesa Verde cliff houses,⁴⁶ and in 1900 C. N. Crottsburg wrote a short description of the ruins in the Montezuma and McElmo valleys.⁴⁷ The last 2 papers did not add materially to our knowledge.

Soon after the turn of the century, the results of the explorations and studies of T. Mitchell Prudden began to appear. He was a New York medical doctor, working with the Wetherills, especially with Clayton Wetherill, and the next major step was made by him. He produced the most complete archaeological map published up to that time of the entire San Juan drainage and put forward a chronological sequence of house types based upon architectural typology.⁴⁸ Unfortunately, the map is of very little practical use except to show certain large concentrations of sites. The sites are located by means of red dots on a base map, constructed by Prudden from other maps and his own observations. It is not entirely accurate with regard to water-courses, and the scale is very small. Consequently, any given site can not be located from it. Only the later sites in the region were observed by Prudden,

for the most part those where McElmo and Mesa Verde Black-on-white pottery is found. The map serves fairly well as a rough indicator of the distribution of such sites.

After his extensive reconnaissance, Prudden became most interested in the sites he calls "small house ruins" and excavated 7 of them, completely or in part. Although his excavations were made much later than his survey, it seems best to abandon our chronological scheme temporarily and list them here.

The sites excavated by Prudden are as follows. The numbers are his, and accounts are to be found in 2 publications.⁴⁹ Site 1 is in Montezuma Valley about 3 miles from Cortez "a few rods west of the highway which runs southward from Cortez and crosses the McElmo wash near Mitchell Spring."⁵⁰ Eight rooms and a kiva were dug and a ground plan is given. Site 2, merely trenched, and Site 3, but slightly excavated, are near Site 1. Site 4 is approximately 35 miles west of Cortez and is located "on Cohon mesa, near the head of a small eastern tributary of Cross Canyon," near the Ackmen (now Pleasant View)-Bluff Road. This is the road locally known as "the Ruin Canyon road" which was relocated in part in 1939. The site is a small unit with a double row of rooms and a kiva. The kiva only was dug and that not completely.

The first 4 sites were dug in 1913, the following 3 in 1915.

Site 5 is also on Cohon⁵¹ Mesa about $\frac{3}{4}$ of a mile east of Site 4, between Ruin and Hovenweep canyons. A 6-room house and kiva were excavated completely.⁵² Site 6 is on Squaw Point between Cross Canyon and Dove Creek on the east and Squaw Canyon on the west, near the south end of the mesa. This is a group

⁴¹ King, 1893.

⁴² McLoyd and Graham, 1894.

⁴³ An earlier McLoyd and Graham Collection was offered for sale in Chicago in 1891 or 1892. A catalogue appeared, containing information as to the source of only a few of the specimens listed, under the name of the Reverend C. H. Green, Proprietor. This is undated but a copy was received by the Peabody Museum Library in 1892. See Green, 1891?

⁴⁴ Nusbaum, Kidder, and Guernsey, 1922, p. 142 and p. 153, footnote 20.

⁴⁵ Gunckel, 1897.

⁴⁶ Peet, 1898.

⁴⁷ Crottsburg, 1900.

⁴⁸ Prudden, 1905, p. 10.

⁴⁹ Prudden, 1914, Sites 1 through 4; Prudden, 1918, Sites 5, 6, and 7.

⁵⁰ I presume that this refers to the Shiprock road. Caution should be expressed here as to the value of the use of roads in locating sites. Roads in the Southwest are often changed, particularly since the advent of motor cars, and serious errors of identification have arisen through failure to realize this. Not only roads but also towns and post offices change their locations and even their names in this region with astonishing rapidity. In this case, however, Prudden locates the ruin according to the U. S. Land Office Survey. It is in the N. E. $\frac{1}{4}$ of the N. E. $\frac{1}{4}$ of Township 35N., Range 16 W. of the New Mexico meridian.

⁵¹ Spelled also Cahone, Cajon.

⁵² With all of Prudden's sites were refuse mounds. The amount of digging he did in these is not specified.

of ruins including a large pueblo and an artificial reservoir. A 6-room unit and kiva were dug completely. Ruin 7 is on the next point west, Bug Mesa, between Squaw and Monument canyons. This is also a large group with a reservoir. Five rooms and part of a kiva were dug here in a double-kiva unit. Leh excavated additional units here in 1937 and 1938.⁵³ It will be seen that the total amount of Prudden's digging was very small.

Prudden's work continued for almost 20 years. From it came the concept of the "Unit-type" combination of small dwelling, kiva, and refuse mound, attributed to a single family or "one clan." This was considered to be the "germ" of the large pueblos and cliff houses and became the basis for the definition of the Pueblo II period at the First Pecos Conference.⁵⁴ Although neither of these conclusions has withstood the light of subsequent investigations,⁵⁵ to Prudden the credit belongs for first organizing and presenting San Juan archaeology in a workable manner for scientific analysis.

It is important to note here the small amount of actual excavation by Prudden, at least as indicated by his publications. In all he dug in 7 sites. In one a small trench was cut; 2 others were excavated but slightly. In 4 only was an appreciable amount of digging done, and this totaled only 25 rooms and 4 kivas, and one of the kivas was but partially cleared. Yet this is the work upon which the house type of Pueblo II for the entire Southwest has been based.

In 1902 the Basket Maker theory was formally presented by George H. Pepper of the American Museum of Natural History.⁵⁶ In his report he lists physical and cultural differences as he sees them and describes numerous objects attributed to the Basket Makers in the Wetherill and McLoyd-Graham collections. This paper is, however, based upon the artifacts and gives little detailed description of the situations in which the material was found. I shall anticipate the conclusions of this section

of the report to call attention, here, to a surprising situation. No paper has since been published which purports to describe excavations in the Mesa Verde region of a site of the kind now called Basket Maker II.⁵⁷ Thus the reader will note that even including the earlier accounts mentioned previously, no description has ever been published of the detail of such excavations, of the positions and associations of objects in the ground, or of stratigraphy, although Grand Gulch where much of the Wetherill material was found is a "type-site" in Southwestern archaeology.

In 1908 the first competent, though limited, report appeared of an excavated site outside of Mesa Verde proper. In that year Sylvanus G. Morley dug Cannonball ruin, a collection of room, kivas, and towers of the "canyon-head" type⁵⁸ in Cannonball Canyon, a southern tributary of the Yellowjacket, in Colorado near the Utah line. His report contains a plan of the main house, and a description of architecture and artifacts sufficient for placing the site as Pueblo III in the developmental sequence insofar as it is now known.⁵⁹

In the same year, 1908, an expedition under the direction of Byron Cummings, then of the University of Utah, was excavating in a large pueblo on Alkali Ridge in Utah. In the party, as students, were A. V. Kidder, Neil Judd, and Jesse L. Nusbaum. Kidder's report⁶⁰ presents a clear picture of the 13 rooms and 3 kivas dug, and he has kindly given me the photographs of the artifacts found. Unfortunately, no detailed reports have ever appeared of the extensive excavations conducted by Cummings in the San Juan. His 2 short generalizing papers⁶¹ contain little of use to students of the region. Kerr, who followed Cummings at the University of Utah, left no published record of the large amount of digging he did in refuse mounds of sites in San Juan County, which can be described only as "pot-hunting." Thus, to show for the years of work by Cummings and Kerr, we have only the short report of the 1908 season, salvaged by Kidder.

⁵³ See p. 28.

⁵⁴ Kidder, 1927.

⁵⁵ See p. 32 *et seq.*; p. 26, footnote 100; and p. 224 *et seq.*

⁵⁶ Pepper, 1902.

⁵⁷ Nusbaum, Kidder, and Guernsey, 1922, describe Basket Maker sites, but they are located in Kane

County, south-central Utah, across the Colorado River from the area we are considering.

⁵⁸ See p. 225.

⁵⁹ Morley, 1908.

⁶⁰ Kidder, 1910.

⁶¹ Cummings, 1910, 1915.

The work of J. Walter Fewkes in the Mesa Verde also began in the first decade of the twentieth century. His initial major publication was a description of Spruce Tree House on Mesa Verde proper which appeared in 1909.⁶² From then until 1926 reports appeared almost annually. There were often as many as 4 a year. The number of these reports probably accounts for the quite erroneous belief that we know all we need to know of the large sites of the Mesa Verde. Fewkes performed a certain service in the clearing and preservation of ruins, and his efforts contributed greatly to the establishment of Mesa Verde National Park, but his reports leave much to be desired. We must not lose sight of the mass of material he presented in disappointment over the omissions, but it is impossible not to wish his point of view had been different. His main interests seem to have been restoration of the ruins and interpretation of the religious symbolism of the prehistoric peoples. His attitude was often quite wide of the scientific, as is shown by the following quotation in regard to Sun Temple, which he named, on the Mesa Verde: "It had a specific use and was, in fact, a temple for sun-fire-serpent worship to be used by the inhabitants of Cliff Palace, the largest cliff house on the park." The specific description of the religion of the prehistoric peoples and the coupling of Sun Temple with Cliff Palace in dogmatic statements are alike unjustified and, unfortunately, are characteristic of much of his work.

Fewkes' excavations included Spruce Tree House,⁶³ Cliff Palace,⁶⁴ Sun Temple,⁶⁵ Far View House,⁶⁶ and others.⁶⁷ Earth Lodge "A",⁶⁸ a pit house, was delved under his direction. It is impossible to overlook the fact that much of this work took place after Nelson and Kidder had applied stratigraphic methods in the Rio Grande. Remains, attributable typologically to all periods from Basket Maker II through Pueblo III in the Pecos Classification, are present in Mesa Verde National Park. Basket Maker III and Pueblo I sites are particu-

larly thick, according to surface indications, on the mesa-tops. Yet this mine of information was ignored by Fewkes with the exception of Earth Lodge "A," and we have little information of that house beyond a detailed description of the wooden roof which was built to protect it. Thus, of all the wealth of chronological development in the Park, we have no records based upon careful, intelligent excavation except an unpublished paper in the Park files written by the present Park Naturalist, Don Watson,⁶⁹ and 2 pit houses described by Lancaster and Watson.⁷⁰

One of the most useful of Fewkes' reports to students of the region is his "Prehistoric Villages, Castles and Towers of Southwestern Colorado."⁷¹ In this he describes sites in the country west of Mesa Verde proper, not covering the ground so thoroughly as Prudden, but giving more information about some of the ruins. The area covered includes the vicinity of the towns of Dolores, Cortez, Yellowjacket, Ackmen (Pleasant View), and Dove Creek; Goodman Point; Bug Point; McElmo, Cannonball, Hovenweep, Hackberry, Ruin, Sand and Wickyup Canyons; and the McLean Basin. Other reports dealing with the region are listed in the bibliography,⁷² including one devoted exclusively to the Hovenweep.⁷³

The only other archaeologist active in the region during the second decade of the twentieth century was Earl H. Morris. With the exception of the excavation of Earth Lodge "A" by Linton on the Mesa Verde, Morris was the only one to examine sites lying chronologically between the Basket Maker II caves and the well-developed "Unit-type" houses. His report of sites east of Mesa Verde proper, between the Mancos and La Plata rivers, presents for the first time descriptions of sites similar to Site 13 on Alkali Ridge.⁷⁴ Excavations in 23 sites are described, but full presentation of the information then obtained, particularly of its chronological significance, did not appear until Morris' La Plata report, published in 1939⁷⁵ (see p. 29, below).

⁶² Fewkes, 1909.

⁶³ Fewkes, 1909.

⁶⁴ Fewkes, 1910a, 1911.

⁶⁵ Fewkes, 1916a, 1916c, 1916d.

⁶⁶ Fewkes, 1917a, 1917b.

⁶⁷ Fewkes, 1920b, 1921a, 1922, 1923a.

⁶⁸ Fewkes, 1920a, 1926.

⁶⁹ Watson, 1939, and p. 28, herein.

⁷⁰ Lancaster and Watson, 1943.

⁷¹ Fewkes, 1919a.

⁷² Fewkes, 1917d, 1918a, 1918b, 1919b.

⁷³ Fewkes, 1923b.

⁷⁴ Morris, 1919a.

⁷⁵ See Kidder and Guernsey, 1920, for an important review of Morris, 1919a.

The investigation by Morris of late Basket Maker and early Pueblo sites came at a most opportune moment. During this time stratigraphic excavation was developing in other parts of the Southwest, and he was the first to apply it in the Mesa Verde region. Early in the decade N. C. Nelson applied stratigraphic methods to sites in the Rio Grande,⁷⁶ and A. V. Kidder adopted them immediately at Pecos Pueblo,⁷⁷ and later, with S. J. Guernsey in the Kayenta district of the San Juan in Arizona.⁷⁸ This technique revolutionized field method and provided the chronological control so sorely needed.

Our knowledge of the San Juan, before the application of stratigraphy, was ably summarized by Kidder in a paper delivered before the Nineteenth International Congress of Americanists at Washington in 1915.⁷⁹ His joint paper with Morley published at about the same time gave further information about the numerous Pueblo III settlements in the McElmo-Yellowjacket drainage.⁸⁰ This publication, however, was based upon reconnaissance and review, not upon any additional excavation.

The first stratigraphic chronology for the Mesa Verde appeared from the pen of Morris in 1921,⁸¹ combining the results of his excavations with the excellent work of Kidder and Guernsey in the Kayenta district in northeastern Arizona.

In 1922 a new investigator, who was to add materially to our knowledge of the early periods, entered the field. F. H. H. Roberts, Jr., at first in association with J. A. Jeançon, began his investigations of the northeastern basin of the San Juan,⁸² including the region around Pagosa Springs and the Piedra Parada which was eventually to result in his Piedra report. Although most of Roberts's early work was concerned with the eastern headwaters, in 1923

he carried his survey as far west as Montezuma Valley.⁸³

In this same year Kidder published a short article pointing out the presence, previously ignored, of Basket Maker II material in the caves of Mesa Verde proper.⁸⁴ In the next year, Judd made a short reconnaissance trip into the lower San Juan Canyons accompanied by John Wetherill.⁸⁵

In 1927 Morris first published the evidence for his theory of independent invention of pottery-making in the San Juan,⁸⁶ later presented with more evidence and at the same time with certain reservations.⁸⁷

The middle of the 1920's marked the transition from the third to the fourth stage of archaeology in the Mesa Verde area, from the period of stratigraphic excavation to the period of analytical studies characterized by excavation directed toward the solution of particular problems.

In 1928 Paul S. Martin, then of the State Historical Society of Colorado, began his investigations in Montezuma County north and west of Cortez.⁸⁸ He and Morris are the only archaeologists who have done a considerable amount of scientific digging in the Mesa Verde area whose works have been published. During his 1928 season, Martin conducted reconnaissance and excavations in the region northwest of Cortez and west of Ackmen (Pleasant View) in townships 38 and 39 North, ranges 18 and 19 West, in Montezuma County, Colorado. Both mesa-top and canyon ruins were included in the survey, which covered 14 large ruin groups; among the former was Lowry ruin, subsequently excavated by Martin; among the latter was Cut-throat Castle in Cut-throat Gulch, similar in type to Hovenweep Castle. The excavations were confined to the Herren ruins, a site consisting of 13 house units, and to a round tower at a similar

⁷⁶ Nelson, 1914, 1916.

⁷⁷ Kidder, 1924.

⁷⁸ Kidder and Guernsey, 1919, 1920; Guernsey and Kidder, 1921; Guernsey, 1931. The reports of Kidder and Guernsey are of great value, because it is from the work of these 2 men, rather than from the work in Grand Gulch, that we have gained most of the useful knowledge we have of Basket Maker II. Their excavations, however, were all south of the San Juan River, well outside the area we are considering here.

⁷⁹ Kidder, 1917.

⁸⁰ Morley and Kidder, 1917.

⁸¹ Morris, 1921a.

⁸² Roberts, 1922; Jeançon and Roberts, 1922-24.

⁸³ Roberts, 1925. The reader must be careful not to confuse Montezuma Valley in southwestern Colorado with the nearby Montezuma Creek, in southeastern Utah. There is also a Montezuma Creek and a Montezuma Mesa (also called Archuleta Mesa) on the upper San Juan, downstream from Trujillo, Colorado.

⁸⁴ Kidder, 1923.

⁸⁵ Judd, 1924a.

⁸⁶ Morris, 1927.

⁸⁷ Morris, 1939, and p. 82, herein.

⁸⁸ Martin, 1929, 1930.

site called Charnel House because of burials in the tower—all Pueblo III ruins. Parts of 2 units at the Herren ruins were dug in which the total number of structures cleared was 4 round towers, 2 kivas, and 26 rooms.

The 1929 season was spent by Martin in the same area, and a long range of time was covered by the excavations. The digging consisted of 22 rooms and 2 kivas at the Pueblo III Bear Tooth Pueblo on the north rim of Ruin Canyon; and excavation at Little Dog ruins, where 3 house types were found in stratigraphic relationship. The lowest of these were 3 Basket Maker III or Pueblo I pit houses; the highest was a unit classified at that time as Pueblo II but of a type now usually placed in Pueblo III. The significance of this site was much greater than was generally realized at the time, particularly because the large amount of work in sites of similar age by Morris was still unpublished. Further excavations by Martin will be described later (pp. 27, 28, 208, 209, 218, 219, 224).

During the 1920's events were occurring outside the immediate Mesa Verde area which, nevertheless, greatly influenced its development. Morris was excavating the large Pueblo at Aztec, New Mexico, which demonstrated the migration of part of the Mesa Verde population into the Chaco region when the northern area was abandoned.⁸⁹ Judd was excavating at Pueblo Bonito in Chaco Canyon,⁹⁰ where he had associated with him Kirk Bryan who was beginning to apply his extensive physiographic knowledge to archaeological problems,⁹¹ and Roberts, whose study of Chaco pottery, based on the Bonito excavations, has been of material aid in the preparation of this report.⁹² Roberts, after the conclusion of the Bonito project, made the first extensive excavation of a Basket Maker III open site, in Chaco Canyon, an investigation of great importance to work in the Mesa Verde region in the 1930's.⁹³ Doug-

lass, with the assistance in the field of Morris, Judd, Haury, and Hargrave, was conducting his study of tree-rings in the ruins of the Southwest which has been one of the most important contributions to archaeological dating technique.⁹⁴ And Kidder convened the Southwestern Archaeological Conference at Pecos which developed the scheme of chronological culture classification still used throughout the Pueblo region.⁹⁵

The 1930's represent the Golden Age of Southwestern archaeology to date. More sites were dug and more articles and reports published than in any 2 preceding decades. Most of this activity was away from the Mesa Verde, but again much of the work in other regions had direct bearing upon the problems of the Mesa Verde. Of outstanding value was the work of the University of New Mexico in Chaco Canyon, running throughout the decade, including reports of the excavation of 3 "small house" ruins, Leyit, Kin,⁹⁶ Tseh So,⁹⁷ and Bc 50-51.⁹⁸

The Hohokam Conference at Globe in 1931,⁹⁹ which gave formal substance to the distinctive culture of the Gila Basin, materially affected the total picture of the Southwest. The discovery of "non-conformist" sites along the Mogollon Rim and the presentation of the Mogollon theory¹⁰⁰ was vitally important to the students of the problems of the first millennium A.D. in the San Juan. The intensive study of northeastern Arizona pottery undertaken by the Museum of Northern Arizona provided comparative material in the region directly south of the lower reaches of the San Juan.¹⁰¹ The works of Julian H. Steward,¹⁰² Noel Morss,¹⁰³ the Peabody Museum Claffin-Emerison Expedition,¹⁰⁴ the University of Utah,¹⁰⁵ and Ben Wetherill,¹⁰⁶ son of John Wetherill, gave us comparative material in immediately adjacent regions to the north and west, previously unknown. Publication of the results of

⁸⁹ Morris, 1919b, 1928.

⁹⁰ Judd, 1922, through 1930.

⁹¹ Bryan, 1925, 1926.

⁹² Roberts, 1927.

⁹³ Roberts, 1929.

⁹⁴ Douglass, 1929, 1931, 1935; Haury and Hargrave, 1931.

⁹⁵ Kidder, 1927, and pp. 34, herein.

⁹⁶ Dutton, 1938.

⁹⁷ Brand, Hawley, Hibben, *et al.*, 1937.

⁹⁸ Kluckhohn, Reiter, *et al.*, 1939.

⁹⁹ Gladwin, 1934.

¹⁰⁰ Haury, 1936b; Nesbitt, 1938; Reed, 1938; Martin, Rinaldo, and Kelly, 1940.

¹⁰¹ Colton and Hargrave, 1937.

¹⁰² Steward, 1931, 1933, 1941b.

¹⁰³ Morss, 1931.

¹⁰⁴ Unpublished material in the Peabody Museum, Harvard University.

¹⁰⁵ Smith, 1934; Gillin, 1941.

¹⁰⁶ Wetherill, 1934.

excavations in Pueblo I, II, and III sites in the Kayenta region by the Rainbow Bridge-Monument Valley Expedition¹⁰⁷ will supplement the information from surface surveys presented by Colton and Hargrave. And the reports by Roberts on his work near Zuni and in the Allantown region of eastern Arizona provide excellent comparative data on the southern periphery of the San Juan in the "buffer" region which separates the Chaco and Kayenta branches from the Mogollon Rim.¹⁰⁸

In the Mesa Verde region, the work during the '30's deals, for the first time, largely with the earlier periods. In 1930 Roberts published his important report on Pueblo I and early Pueblo II sites along the Piedra River east of Durango.¹⁰⁹ He excavated 62 rooms and 2 kivas. At the time the results were published, many students thought that these sites were too far to the eastward to be typical of the Mesa Verde area, particularly as regards house types. More recent work has shown this supposition to be largely erroneous, although a few structural details in the Piedra houses have not as yet been found elsewhere.

In 1932 a paper by George Woodbury appeared in the *Colorado Magazine* describing his excavations of early Pueblo sites in Paradox Valley in the Dolores drainage in 1931 and his reconnaissance of La Sal Creek, the San Miguel-Dolores confluence, and Naturita Creek.¹¹⁰ Jeançon and Roberts barely reached Paradox at the end of their 1924 season and, with the exception of their brief survey, Woodbury's report is the only description of sites in the western end of Montrose County.

During the first half of the decade, Paul S. Martin of the Field Museum excavated the Lowry ruin,¹¹¹ at Sylvan, 9 miles west of Ackmen (Pleasant View). Thirty-seven rooms were dug and 8 kivas, including a Chaco type "Great Kiva," 47 feet in diameter.¹¹² His report is of particular value because Lowry

Pueblo shows the transition between Chacoan (Mancos Black-on-white) and Mesa Verde (McElmo Black-on-white) styles of pottery decoration. In terms of the Pecos Classification, the large house was occupied during Pueblo II and Pueblo III. Martin thus gave us the first real indication we had, in published reports, that something was wrong with the concept of Pueblo II as a period of small, "Unit-type" houses. Few people realized it at the time, but I think we may now list this discovery as one of the more important contributions to Mesa Verde archaeology. This was followed by Morris' reassignment of the "Prudden Unit-type" house to Pueblo III instead of to Pueblo II.¹¹³ I may as well complete the picture as I see it here by suggesting that careful excavation of other large Pueblo III sites in the Mesa Verde region will probably show substantial Pueblo II "levels" in many of the large cliff houses and open sites.

In 1931 the Peabody Museum Southeastern Utah Expedition, of which this is the report, began digging on Alkali Ridge in San Juan County, Utah, southwest of Monticello and east of Blanding (see map, fig. 3). Excavations were continued in 1932 and concluded in 1933, with a total of 234 rooms and 10 refuse mounds at 13 sites examined, covering all cultural periods from Basket Maker III to and including Pueblo III in the Pecos Classification. The rooms cleared included 195 storage and living rooms, 15 pit houses, and 14 kivas. A table showing the excavations and the taxonomic periods covered by them will be found on page 87. The sites are described on pages 106-202.

Throughout the '30's many articles appeared in the *Occasional Papers of Mesa Verde National Park* and in *Mesa Verde Notes*,¹¹⁴ contributed by members of the Park staff and others.¹¹⁵ Much valuable information is presented in these publications. They do not,

¹⁰⁷ Now published Beals, Brainerd, and Smith, 1945. An excellent report, including one of the best studies, to date, of pottery design in the Southwest.

¹⁰⁸ Roberts, 1932, 1939, 1940.

¹⁰⁹ Roberts, 1930. From now on, in this chapter, discussions of the major works will be more limited than formerly, because they are described in considerable detail later on in the report. For further reference to Roberts' Piedra report, see pp. 220-22.

¹¹⁰ Woodbury, 1932.

¹¹¹ Called the "Acmen Ruin" by Fewkes. Fewkes, 1919a, p. 29.

¹¹² Martin, Roys, and von Bonin, 1936.

¹¹³ See pp. 39-40.

¹¹⁴ See bibliography under Burgh, Cline, Casey, Caywood, Dennison, Douglas, Franke, Laybourne, D. Moorhead, Morse, Rife, Thompson, Watson, Wood, Wyman, Yelm.

¹¹⁵ Since this was written, Don Watson, Park Naturalist at Mesa Verde, has published an excellent "popu-

however, represent additional excavation but rather library and laboratory research and reconnaissance. At this point I wish to reiterate that, when I note the absence of excavation in many of these reports, I do not imply adverse criticism of them. Good analytical studies are as important as good excavations. The purpose of the emphasis is to dispel the illusion that sufficient excavation already has been done in this area.

Beginning in 1935 a study, by C. T. Hurst and V. F. Lotrich, of the pottery of the Gunnison Collection appeared serially in *Southwestern Lore*, including some very good illustrations of Mesa Verde vessels and designs.¹¹⁶ This is another description of collections in a museum. Many vessels and designs are illustrated and described but, unfortunately, the provenience of the objects is not given.

In 1936 a short article appeared by W. S. Stallings, Jr., in the *Tree-Ring Bulletin*, assigning dates to 2 timbers from an unexcavated ruin in a cave on the west side of Westwater Canyon, about 3 miles southwest of Blanding, Utah. The beams were collected by Deric Nusbaum and Zeke Johnson. Their observations recorded 5 kiva depressions and over 20 ground-floor rooms. They classified the pottery as Pueblo I and Pueblo III, the latter of Mesa Verde type. Stallings dated the timbers as having been cut between the growing seasons of 1243 and 1244 A.D.¹¹⁷

In a supplement to the *Southwestern Monuments Monthly Report* for May, 1937, C. R. Steen published a description of 9 sites, in one of which he cleared 1 room and 2 kivas, in Natural Bridges National Monument in San Juan County, Utah, west of the town of Blanding.¹¹⁸ The outstanding feature of the report is a kiva with the roof and runged-ladder remaining *in situ*.

In 1937 Martin, his Lowry report finished, turned his attention once more to earlier sites in a 2-year program of excavation in the Sylvan district west of Ackmen, Colorado, which provided excellent comparative data¹¹⁹ for this

report. Six sites were dug with the cleanest and most careful excavation technique ever applied in the Mesa Verde area. The only important criticism of this work is a justifiable questioning of the wisdom of classifying sites which are definitely dated in the eighth and ninth centuries, by dendrochronology and general typology, as Basket Maker III. Six sites were dug in which 85 rooms, 13 pit houses, 3 kivas, and 2 very large circular structures of unknown use were cleared.

Also in 1937, Leonard L. Leh of the University of Colorado began excavations at the Wilson ruins in San Juan County, Utah, 18 miles southwest of Dove Creek, Colorado. This is the group in which Prudden dug in 1915¹²⁰ and which was called Bug Mesa ruin by Fewkes.¹²¹ This work has resulted in 3 papers in *Southwestern Lore*.¹²²

In 1939, C. T. Hurst began excavation of caves on the Uncompahgre Plateau in central Montrose County. Although rather outside the area we are considering, these caves are mentioned here because they add to our meager knowledge of Basket Maker II. The work was sponsored by the museum of Western State College, Gunnison, Colorado. The excavation of 2 caves has been completed. Six short descriptive papers have been published.¹²³

There has been very little modern scientific excavation within the confines of Mesa Verde National Park. In 1939 Don Watson, Park Naturalist, dug a Pueblo I pit house on the mesa-top; and in 1941 J. A. Lancaster and Watson dug 2 Basket Maker III pit houses, also on the mesa-top. The results of the last-named dig, only, have been presented in a published report.

In general the Park staff is not provided with funds for excavation nor is time allowed for that purpose. However, during the spring of 1939, a trench for a new water pipe exposed a Pueblo I pit house, dated by tree-rings in the eighth century A.D., and similar to many excavated by Morris, Martin, and myself in other parts of the area. Watson and members

lar" account of Cliff Palace. In 142 pages he presents to the general public a well-written summary of our archaeological knowledge; the modern history of the Mesa Verde; and a vivid conjectural account, based on archaeological findings, of life in Cliff Palace during the 4 seasons of 1266 A.D. See Watson, 1941.

¹¹⁶ Hurst and Lotrich, 1935-36.

¹¹⁷ Stallings, 1936.

¹¹⁸ Steen, 1937.

¹¹⁹ Martin, Lloyd, and Spoehr, 1938; Martin and Rinaldo, 1939; and pp. 203-26 herein.

¹²⁰ Prudden, 1918, Ruin 7.

¹²¹ Fewkes, 1919a, p. 19.

¹²² Leh, 1938, 1939, 1940.

¹²³ Hurst, 1940, 1941, 1942, 1943, 1944, 1945.

of his staff conducted voluntary salvage operations during evenings and their "days-off." The pit house, including its southern antechamber, was completely cleared, and ground plan, conjectural reconstruction, and photographs appear in the report which is intended for publication.¹²⁴

During the summer of 1941, an official Park excavation cleared 2 Basket Maker III pit houses, B and C, for the purpose of providing the public with better examples of early structures than that afforded by Pit House A. Lancaster and Watson have published a detailed report, with plans and photographs, of their careful excavations.¹²⁵ The pit houses had much in common with those dug by Roberts at Shabik'eshchee in Chaco Canyon and with the earliest at Site 13 on Alkali Ridge (Pit Houses H, I, and K). Mesa Verde Pit House B has been protected by a wooden shelter and is now part of the Park display.

The decade was brought fittingly to a close by Earl Morris' monumental paper describing his field work from 1915 through 1930 in the La Plata district of southwestern Colorado and northwestern New Mexico¹²⁶ with an appendix on the technology of La Plata pottery by Anna O. Shepard. Excavations in a large number of rooms in 10 sites are presented in detail, and 15 other sites are placed in position in the cultural sequence by comparison, with the excavated sites, of information obtained from surface surveys, test trenches, and digging in refuse mounds.¹²⁷ Because of the great range of types of ruins studied, the splendid extensive historical reconstruction in the introduction, and Miss Shepard's very pertinent remarks on the nature and use of technological analysis of pottery, this report may be considered the most important which has appeared on the Mesa Verde area.

Morris continues his work in the San Juan, and this summary would not be complete without mention of his excavations during 1938, 1939 and 1940 near Durango, Colorado, as yet almost entirely unpublished. This work has produced one of the earliest tree-ring dates in

the Southwest. In addition it has revealed habitation sites in the open, rather than in caves, of the pre-pottery Basket Maker II period which Morris had long suspected¹²⁸ would eventually be found. A preliminary statement has been published describing the excavations and the artifacts found.¹²⁹ In summarizing the findings Morris writes, "The 1940 site in the open paralleled in every respect the nearby cave excavated in 1938. The culture that flourished in these was classic Basket Maker or Basket Maker II of the Pecos nomenclature. . . . It differs from the accepted picture of Basket Maker II in that the people were comparatively short-skulled (ranging from meso- to brachycephalic) and constructed for themselves dwellings that were both commodious and substantial." The significance of Morris' statement about skull form will be apparent when the reader reaches the chapter on the "Pueblo Invasion" (pages 67-73).

In addition to his recent excavations Morris has published another detailed report of his many years' work in the San Juan. This is a study of the basketry, from Basket Maker II through Pueblo III, prepared with the assistance of Mr. Robert F. Burgh.¹³⁰ Technology, forms, and decorative designs are described with 127 drawings and 249 photographs, the whole constituting an extremely valuable source book. In addition, it contains a good map of the San Juan drainage.

Other people have also been active in the Durango region, and the results of their efforts in areas previously unreported are now available in Mrs. Helen Sloan Daniels' compilation of the work of the Durango Public Library N. Y. A. projects,¹³¹ and in a weekly column, called "Sherds and Points," published in the *Durango News* by I. F. Flora and Mrs. Daniels,¹³² printed separates of which are obtainable in notebook size.

One other excavation project should be noted, although the results are not yet published in full. In the spring of 1942 Erik Reed, Regional Archaeologist of the National Park Service, excavated 5 sites on the lower Mancos

¹²⁴ Watson, 1939.

¹²⁵ Lancaster and Watson, 1943.

¹²⁶ Morris, 1939.

¹²⁷ For further information about this report, see pp. 39, 230-31.

¹²⁸ Morris, 1939, pp. 16-18.

¹²⁹ Morris, 1941, pp. 305-06.

¹³⁰ Morris and Burgh, 1941.

¹³¹ Daniels, 1940.

¹³² Flora, Daniels, and Cornelius, 1940-41.

River south of Mesa Verde in Montezuma County, Colorado, when a new road through the Ute Reservation threatened to destroy these sites.¹³³ Surface surveys were made of 24 other sites. They ranged from Basket Maker III through Pueblo III in the Pecos Classification. A pit house, 3 kivas, and 22 rooms were excavated, in addition to refuse mounds. The report is carefully prepared with much detail systematically presented and in addition contains a considerable amount of useful observation on Southwestern archaeology in general, on the archaeology of the Mesa Verde region in particular, and on archaeological theory and methods.

Before concluding this account of the history of archaeological research in the Mesa Verde, mention should be made of the extensive restoration and preservation of sites and artifacts in the region, mostly under the auspices of the United States Government. The museum and ruins at Mesa Verde National Park are well known. The work of Nusbaum, Fewkes, Franke, and many others in building up this Park and making it available, by means of good roads, to so many people is one of the greatest archaeological achievements the world has seen. One of the more recent additions to the Park museum is a series of models, arranged by cultural periods, showing life on the Mesa in prehistoric times. One of these is shown in figure 91, *a*. In addition to the Park, the Government is preserving sites at Yucca House, Hovenweep,¹³⁴ and Natural Bridges National Monument.

Also the Durango Public Library now has a museum and laboratory, under the direction of Mrs. Daniels, where Animas Valley material may be seen; and much material from the Mesa Verde area is housed in the museum of the Colorado State Teachers' College in Gunnison.

SUMMARY

In my attempt to give the complete story of prehistoric research in the Mesa Verde area, it may appear at first glance that there has been a great deal of it and that my contention of insufficient work is in error. However, the important criterion for judgment is not the number of individual projects but rather the

usefulness of the results, particularly the published results, of these projects for the purposes of historical reconstruction. To provide any great degree of usefulness, excavations must have been conducted with a stratigraphic technique, and relationships between the various kinds of evidence described in the publications must be made clear. The association of each artifact with architectural features, with stratigraphic levels, and with other artifacts must be given. A brief summary will show that little of the work described above fulfills these requirements.

1. The eighteenth-century Spanish explorations merely established the fact that ruins existed.

2. The early nineteenth-century traders, cattlemen, and Mormon explorers added little more.

3. The railway and the U. S. Government surveys consisted purely of reconnaissance.

4. Excavations in the 1880's and 1890's were either very limited or, where extensive, are not described in published reports.

5. Between 1900 and 1910 excavations consisted of work in a few small sites, all of one type, by Prudden; a single site by Morley; and the work of Cummings, unpublished except for a short description by Kidder of a small amount of digging in a large site on Alkali Ridge. All of this excavation antedated stratigraphy, and in the publications the emphasis is almost entirely on architecture, with very little mention of associated artifacts.

6. The large amount of work by Fewkes in the second decade of the twentieth century is almost completely useless in terms of the requirements stated above.

7. During this same decade, Morris began the first excavations from which we were to obtain the kind of information needed, but this was not published in usable form until 1939.

8. In the late 1920's we had Roberts' excellent report of a group of sites on the eastern extremity of the area, 2 short reports of excavations by Martin, and the continuation of Morris' investigations.

9. In the 1930's all of the projects were small, except for the work of Martin. The operations under the auspices of the Durango

¹³³ Reed, 1943 and 1944c.

¹³⁴ The Park Service has also published bibliogra-

phies of Mesa Verde, Yucca House, and Hovenweep. See U. S. National Park Service, 1941.

Public Library and the National Youth Administration (N. Y. A.) are not as yet very extensive, though the evidence found is being handled in a modern scientific manner.

Thus the sort of information we want has been provided in appreciable quantity only by the excavations of Morris and Martin, plus a single season's work by Roberts. An analysis of the situation produces surprising results:

1. In the entire area, roughly 250 miles in length and 100 miles wide, extending from the Colorado River to Pagosa Springs and embracing the entire northern drainage of the San Juan, except for that section of northern New Mexico which is classified in the Chaco area, studies involving stratigraphic excavation over a period of years have been made in only 3 districts: the La Plata region (Morris), the district west of Pleasant View-Ackmen in Montezuma County (Martin), and the Durango district (Morris, Daniels, Flora). The 2 last regions are of very limited geographical extent. And all 3 are in the state of Colorado. The large area in Utah between the Colorado line and the mouth of the San Juan, full of sites ranging from Basket Maker II through Pueblo III, was practically untouched before the excavations of which this is the report.

2. The excavations in this area which have had the most widespread influence on formal cultural classification in the Southwest are not even listed in the paragraph above. They are omitted because the material evidence from them is either not available, not sufficient, or presented in such form as to be practically useless. I refer to 3 groups of sites or projects: the Basket Maker II "finds" in Grand Gulch and Butler Wash in southeastern Utah (Wetherill, etc.); Prudden's excavations which formed the basis for the confusing definitions of Pueblo II; and the extensive cleaning out, rather than excavation, by Fewkes of large Pueblo III sites in Mesa Verde National Park, upon which is based the assumption that Pueblo III culture in the region is well known.

¹³⁵ I repeat here what I have written on p. 27, that I believe that careful excavation of the larger sites now assigned exclusively to Pueblo III will in many cases reveal extensive Pueblo II levels. In some cases, particularly in the mesa-top sites, I would even expect to find at the very bottom a good-sized Pueblo I house of the type described on pp. 189-97 and discussed on pp. 218-20.

The first is almost entirely unpublished, the little that we have being merely limited descriptions of some of the artifacts, so that we have no detailed knowledge of the Basket Maker II culture of the area. The second represents very little excavation and almost no useful description of artifacts. The third completely ignored stratigraphy at a time when the technique could and should have been applied.

3. With regard to the last mentioned, a most amazing fact develops. Of the many large pueblos of the region, supposedly so well known, only *two* have been excavated by stratigraphic methods, followed by publication in a form useful for modern analysis.¹³⁵ One of these is Morris' Site 41 in the La Plata Valley, on the border of the Chaco country just south of the Colorado line in northern New Mexico.¹³⁶ The other is Martin's Lowry ruin in Montezuma County, Colorado, which on the basis of our present knowledge we must consider possibly in part atypical.¹³⁷ The only sites scientifically excavated on Mesa Verde proper are the Pueblo I pit house dug by Watson in 1939¹³⁸ and 2 Basket Maker III pit houses dug by Lancaster and Watson in 1941.¹³⁹ Thus, in terms of our requirements stated above, the details of the cultural developments in Classic Mesa Verde Pueblo III are *not* familiar, but are virtually unknown.¹⁴⁰

One, therefore, arrives at a number of conclusions about the basic archaeological needs of the Mesa Verde area, conclusions which are startling in terms of generally held conceptions of the status of Mesa Verde archaeology:

1. Much more work in all periods and types of sites is necessary.

2. Excavations should be planned in order to provide material for studies of the geographical distribution of traits in the region.

3. Excavations should be planned to show more clearly relationships with neighboring areas.

4. We are greatly in need, perhaps above all, of scientific excavation of Basket Maker II sites and of large Pueblo III sites.

¹³⁶ Morris, 1939, pp. 85-113.

¹³⁷ Martin, Roys, and von Bonin, 1936.

¹³⁸ Watson, 1939.

¹³⁹ Lancaster and Watson, 1943.

¹⁴⁰ This fact is fully realized by and has handicapped the competent men who have been engaged during the last 10 years in installation of the excellent museum at Mesa Verde National Park.

THE DEVELOPMENT OF FORMALIZED CULTURE CLASSIFICATIONS IN THE SOUTHWEST

Any classification is a composite edifice, planned, built up, and added to by architects and labourers of very different outlook, skill and taste.

— ARKELL AND MOY-THOMAS

THE first object of the Peabody Museum Southeastern Utah Expedition when it took the field in 1931 was to obtain information about the Pueblo inhabitants of the region during what was then generally called the Pueblo II period, later roughly dated as 900 to 1100 A.D. On the basis of Prudden's limited excavations, which antedated stratigraphic studies, it was assumed that people at that time lived scattered in "family groups" occupying houses known as "Prudden Unit-type" dwellings.¹ This assumption had played a strong part in the formulation of the Pecos Conference Pueblo culture scheme. At the same time further assumptions, couched in terms as vague as the evidence behind them, were made as to the pottery, tools, sandals, and other attributes of the material culture of the peoples of these 2 centuries. The latter assumptions were not based upon excavation at all but upon generalized deductions from types of artifacts known to have preceded and followed this period. In the absence of stratigraphic information for the tenth and eleventh centuries this was the best the formulators of the Pecos Classification could do, and they called the period Pueblo II.

However one looked at the published definitions of Pueblo II culture, they were unsatisfactory. For the most part they were non-specific to the point of uselessness. The one specific criterion, houses, also seemed open to suspicion. The pottery described by Prudden as having been found in "Unit-type" sites closely resembled the pottery attributed by the Pecos Conference to the following period, Pueblo III, 1100 to 1300 A.D. Surface observation of "Prudden's Unit-type" ruins in the Mesa Verde area served to confirm this suspicion.

Consequently, at the suggestion of A. V. Kidder, I went to Alkali Ridge in southeastern

Utah to attempt to find sites which might help to fill this gap of 2 centuries. A second major object which developed during the second field season was to determine what took place during the seventh, eighth, and ninth centuries A.D.

To show why such information is important to the story of the prehistoric Southwest, it will be necessary and advisable to review briefly that story as it is postulated at present and the steps by which those postulations were reached.

After the discovery and announcement of the "Basket Makers," previously described on page 20, the realization began slowly to form in the minds of students of Southwestern prehistory that a much longer cultural development than had previously been supposed lay recorded in the many ruins. One may say that during the first decade of the twentieth century the concept arose of the development of cultures as the proper field for archaeological research in the Southwest. The application by Nelson² of stratigraphic technique pointed the way by which this end could be achieved. The first formal presentation of Southwestern culture, divided into classificatory phases and listed in historical sequence, appeared shortly afterward.

In 1919 Kidder and Guernsey published, jointly, the report of their explorations and excavations in northeastern Arizona conducted in 1914 and 1915. Three distinct cultural phases were listed:³

1. Basket Maker culture.
2. Slab House culture.
3. Cliff House culture.

A short résumé of the differentiating criteria by which the three were distinguished follows:

Basket Maker culture. Characteristics of this culture as distinct from the others⁴ presented at this time were:

¹ Prudden, 1905, 1914, 1918, and pp. 22-23, herein.

² Nelson, 1916.

³ Kidder and Guernsey, 1919, pp. 200-12.

⁴ Kidder and Guernsey, 1919, pp. 204-06.

1. Undeformed dolichocephalic skulls.
2. Apparently no domestication of the turkey.
3. Flint corn only (?).
4. Apparently no beans.
5. Fine-cord, square-toed sandal with bottom reinforcement covering whole sole.
6. Guitar-shaped cradles; grass-edge and cedar-bark cradles abundant.
7. Coiled basketry, somewhat coarser than Pueblo.
8. Hair string, twined bags, and fur cloth common.
9. Cotton cord, loom cloth, and turkey feather cloth absent.
10. Atlatl (spear-thrower).
11. Short and squat pipes.
12. Pottery rare, perhaps even absent.

Information on houses was very meager. The Basket Makers were thought to live in caves and to have slab-lined storage cists. No direct superimposition of Pueblo over Basket Maker was found by Kidder and Guernsey, but it had been reported⁵ and was indicated in the Arizona work.

Slab House culture. Found under "Cliff House" in Fluteplayer House, Hagoé Canyon, northeastern Arizona. The outstanding features were:

1. Roundish semisubterranean houses, the lower walls of upright slabs, the upper walls of coursed-adobe turtlebacks.
2. A round building with roof poles set in an angle at a narrow shoulder.
3. Black-on-white pottery some of which presents striking similarities to some of the Chaco Canyon black-on-white.

Cliff House culture. This had coursed-masonry houses, kivas, and high development of pottery, with polychrome and "heavy" design black-on-white. The Cliff House culture here described was termed Kayenta in recognition of its divergences from that of the cliff houses in the Chaco and Mesa Verde regions. In comparison with the Basket Maker culture the following differences were listed (compare with Basket Maker list previously given):

1. Strongly deformed back of skull (occipital flattening).
2. Turkey domesticated.
3. Various well-developed types of corn.

4. Beans abundant.
5. Fine-cord, pointed-toe sandal with bottom reinforcements covering only part of sole. Side-loop tie and sandals of twilled whole yucca leaves (absent in Basket Maker) were abundant.
6. Oval cradles. Grass-edge and cedar-bark cradles absent (?).
7. Very fine coiled basketry; twilled yucca ring baskets abundant.
8. Hair string and fur cloth rare; twined bags absent.
9. Cotton cord, loom cloth, and turkey feather cloth common.
10. Bow and arrow.
11. Long and slim pipes.
12. Pottery very abundant.

Such is the situation as described by Kidder and Guernsey in 1919. It is to be noted that most of the differences listed between the Basket Maker and Cliff House cultures were in those articles of material culture found in cave refuse deposits, a natural result arising from the nature of the field work upon which the generalizations were based. For the Slab House culture the only specific characters given referred to houses and was significant only in that it indicated that the investigators believed that that type of house belonged with neither the Basket Maker nor Cliff House cultures and lay in an intermediate position in the time-scale. No significant statements beyond presence in the later culture and possible absence in the earlier were made about pottery.

In January of 1921 Morris published his "Chronology of the San Juan Area." In his scheme 4 periods were presented instead of 3. The first, Basket Maker, was the same as in the Kidder-Guernsey list. Period II was called Pre-Pueblo and the following distinctive characteristics were attributed to it:

1. Skulls mostly dolichocephalic with a minority of deformed brachycephals.
2. Houses usually upright poles plastered with adobe mud; occasionally of stone slabs and coursed masonry; pit houses also present.
3. Pottery was common; less than 30% was decorated; the decoration, however, was not described; corrugated pottery doubtfully present.

⁵See pp. 20-21.

The Cliff House culture of Kidder and Guernsey was divided into 2 parts, Early Black-on-white period and Late Black-on-white period. The Early Black-on-white period was described as follows:

1. Skulls brachycephalic, with occipital flattening.
2. Small and large buildings of unfaced stones (coursed masonry), which may have been of more than 1 story in some cases; the usual forms were rectangular, L-shaped, or E-shaped.
3. Kivas with all of the characteristics diagnostic of later kivas.
4. Pueblo textiles and sandals.
5. Three types of corn.
6. Smooth and corrugated pottery; pitcher-shaped drinking vessels; "half-gourd" pottery ladles; absence of exterior decoration on bowls characteristic; highest form of decoration.
7. No sites thoroughly investigated.

For the Late Black-on-white period Morris says:

1. Crania seem to be the same as in Early Black-on-white.
2. Ruins are relatively few and large, with 2, 3, and 4 stories rising terrace-fashion from an enclosed court; much facing of building blocks, some actually polished.

At the time when this was written Morris had been excavating for 10 years in the San Juan. In his Pre-Pueblo period the complicated house type situation was first revealed and was a reflection of the fact that he had excavated many more sites than the other people who were concerned with the problems of cultural development. Description of pottery in any detail was restricted to the Early Black-on-white period, yet for this period the statement was made that no sites had been thoroughly excavated.

The investigation continued and in 1921 Kidder and Guernsey published further findings.⁶ One new culture phase was added to their original list, and the name of one of the original phases was altered. The expanded sequence was:

1. Basket Maker culture, still considered the earliest.

⁶ Guernsey and Kidder, 1921.

2. Post-Basket Maker, a new classification.
3. Pre-Pueblo (formerly the Slab House culture).
4. Cliff Dweller Pueblo.

The connection between the new phase, Post-Basket Maker, and the Basket Maker was presented in the following features:

1. Undeformed, dolichocephalic crania.
2. Presence of a twined-woven bag, although a degenerate type.
3. The use of fur cloth instead of feather cloth.
4. Absence of cotton.

Its advances from Classic Basket Maker were:

1. Undecorated pottery of distinctive shape, without coiling.
2. Permanent house-structures; slab base walls with stone and adobe above.

The Slab House culture was definitely established as a Pueblo culture with deformed skulls and other Pueblo characteristics and the name changed to Pre-Pueblo. An overlap was mentioned in house type between the Post-Basket Maker and Pre-Pueblo groups, the only houses definitely associated with either having upright slabs in the lower walls. Yet very little specific information as to houses or pottery was added by this new presentation. It is of value to our present argument in that it suggests that difficulty existed in distinguishing the houses inhabited by those people called "Basket Maker" from the dwellings of those called "Pueblo." We shall see that this difficulty soon extended to other traits.

The next major step in the reconstruction of Southwest culture sequence came in 1927. On August 29-31 a meeting of almost all of the people then working in Southwestern archaeology was held at Pecos, New Mexico, where Dr. Kidder was conducting excavations for Phillips Academy, Andover, Massachusetts. The purposes of the meeting were to discuss the problems, pool the knowledge, and do whatever co-ordinating seemed possible. After much discussion the following 8 stages were agreed upon by the majority of those present and published by Dr. Kidder in his report of the conference.⁷

⁷ Kidder, 1927.

Basket Maker I or Early Basket Maker. A postulated stage, pre-agricultural. The people who, with the development of agriculture, became

Basket Maker II. The Basket Maker of the 1921 list.

Basket Maker III. Late Basket Maker or Post-Basket Maker. Pit- or slab-house-building, pottery-making, undeformed longheads.

Pueblo I, or Proto-Pueblo. First stage with cranial deformation. Vessel-neck corrugation. Development of villages with rectangular living rooms and true masonry.

Pueblo II. "The stage marked by widespread geographical extension of life in small villages; corrugation, often of elaborate technique, extended over the whole surface of cooking vessels." This is the entire statement for Pueblo II.

Pueblo III, or Great Period. Large communities, high development of the arts, intensive local specialization.

Pueblo IV, or Proto-Historic. Contraction of area occupied by Pueblo people; gradual disappearance of corrugated wares; general decline from cultural peak of Pueblo III.

Pueblo V, or Historic Period. From 1600 A.D. to the present.

Briefly the changes from earlier classifications were these: postulation of an earlier period which must have existed, unless the Basket Maker entered the Southwest as Basket Maker II; division of the Pueblo before the Great Period into 2 phases, one the same as that previously called Pre-Pueblo, the other apparently based upon the knowledge, from observation, of large numbers of small Pueblo sites, particularly throughout the San Juan, at that time practically undug; the addition of 2 periods, Pueblo IV and Pueblo V, preceding and following the coming of the Spaniards to the Southwest.

The statement about Pueblo II, quoted in full above, gave little actual information and no characterization of painted pottery or houses. This is understandable when it is realized that the Pecos Conference could point to no excavated site and say, "This site or this part of the site can be classified within the

period called Pueblo II." Unfortunately, impatience led to the expansion of this statement, as we shall see presently, before excavation could provide observation and stratigraphic evidence.

After 1927 the campaign of Pueblo cultural sequence determination was vigorously taken up by Dr. Frank H. H. Roberts, Jr. In the introductions to his various publications he reviewed the situation, year by year, meanwhile conducting excavations in sites which gave promise of settling many of the problems.

The first of these appeared in 1929.⁸ In this discussion of the Roberts' introductions only new or altered information will be given. The contributions in this respect in 1929 were:

Basket Maker I: flimsy, perishable dwellings postulated.

Basket Maker II: squash as well as flint corn; unfired clay vessels molded in baskets, with cedar-bark tempering.⁹

Basket Maker III: slab-lined storage and burial cists of Basket Maker II enlarged into pit houses with pole, brush, and plaster covering, resulting in a semisubterranean permanent house; fired and painted pottery appears; several varieties of corn; beans, also; feather robes begin to come in; and the bow and arrow. The period of Shabik'eshchee Village.

Pueblo I: rectangular, contiguous rooms with slab walls, frequently augmented by true masonry.

Pueblo II: first definite attribution of "Prudden Unit-type" houses to Pueblo II.¹⁰ Also first mention of Pueblo II Black-on-white; "The painted wares were quite generalized in style and form."

Pueblo III, IV, and V: expanded statement listing major types and sites.

It is to be noted that certain traits previously considered distinctively Pueblo now appear in the tail end of the Basket Maker period. These are the bow and arrow, cultivated beans, and feather cloth. With pottery also in Basket Maker III, and house type overlapping, it might be said of the 1929 list of traits that it indicates a greater cultural difference between the Basket Maker II and Basket Maker III periods than between Basket Maker III and Pueblo I when

⁸ Roberts, 1929, pp. 3-7.

⁹ Discovered in Arizona by Guernsey and Kidder,

1921, p. 98.

¹⁰ Prudden, 1914, 1918.

the invasion of a new people and culture was supposed to have taken place.

The house type situation was still quite unsatisfactory and indicative of the thesis of the foregoing section of this report that all of this was based on relatively little excavation useful for the purpose. Dwellings were postulated for Basket Maker I on the perfectly good grounds that a group of people living in a rugged environment with a well-developed hunting and food-gathering culture would have some sort of artificial shelter. However, speculation as to the nature of Basket Maker I seemed so fruitless and fantastic at that time that it was soon to be abandoned as a defined period. It is possibly coming back to us now, with specific traits attached but under a number of different names. And even though passing attention was given to the houses of Basket Maker I, caves were still considered sufficient for the housing of the people of Basket Maker II.

The pit house of Basket Maker III, the first permanent house as yet recorded in 1929, was considered to have been derived from the slab-lined storage cists of Basket Maker II. This architectural derivation was later retracted by Roberts¹¹ as he continued excavation in sites of this period, and he subsequently described the contiguous slab-walled rooms, in 1929 listed as the Pueblo I house type, as the derivatives of the isolated storage cists. This is discussed thoroughly later in the sections dealing with the development of kiva and house architecture, pages 203-26. In the Shabik'eshchee report Roberts also presented a discussion of subterranean and semisubterranean earth lodges in western North America and eastern Siberia.

For Pueblo I nothing was said about houses except: "The crude, one-room domiciles gave way to structures with several contiguous rectangular rooms the slab walls of which were frequently augmented by true masonry."

The Pueblo II statement will be quoted in full because this is the formal debut of the "Prudden Unit-type" house as the architectural diagnostic for Pueblo II. "The second Pueblo phase was the small-house period, which was marked by widespread distribution of life in small villages. In the San Juan area the general

type of dwelling was that which has been called the unit or one-clan house (with a footnote reference to Prudden, 1903). The walls were completely constructed of masonry and the dwelling was entirely above ground. The houses contained several rooms, were one story in height, and there was generally a court on the south or southeast side. Beneath the courtyard was a circular ceremonial room or kiva. Corrugated pottery, so plentiful in southwestern ceramic collections, with elaborate indentations covering the entire surface of the vessel, was one of the distinctly characteristic features. The painted wares were quite generalized in style and form."¹²

This represents Roberts' attempt to do what he could in the absence of stratified excavation without making unsupportable statements. One of the disadvantages of a formal scheme is the pressure brought to bear by the scheme itself to go further than the evidence justifies in filling classificatory gaps.

The next year Roberts published his report on excavations in Pueblo I villages of the Piedra district of southwestern Colorado. In it the jacal (post-and-adobe) type of house is definitely associated with Pueblo I, and small single- and double-room coursed-stone houses appear with the post-houses at the end of the period. Some corrugated pottery of Pueblo II type was found in the latter. But the house-type of Pueblo II is still the "Prudden Unit-type" in the trait lists in the introduction. The small amount of corrugated pottery found and the distance of the Piedra from the nuclear area of San Juan cultural development did not provide sufficient evidence to discredit the theory that the Prudden houses were characteristic of Pueblo II.

In 1931 Roberts published the results of his work at Kiatuthlanna in eastern Arizona. Here he found pit houses with culinary ware of the smooth-necked Basket Maker type and of the banded-neck Pueblo I type. The decorated ware was definitely Pueblo I in character. The burials were described as both longheaded and roundheaded, deformed and undeformed. In the introduction to this report no additional information was given for Pueblo II.

It should be noted that by 1931 4 house

¹¹ Roberts, 1931.

¹² Roberts, 1929, p. 5.

types had been definitely associated with the pottery called Pueblo I and with the Pueblo I period: (1) semisubterranean pit houses; (2) contiguous-roomed slab houses sometimes with coursed masonry above the slabs; (3) jacal houses; and (4) single- and double-room coursed-masonry buildings.¹³

During this same year, 1931, we heard again from Guernsey. He presented a "Table of Differences, Marsh Pass Region"¹⁴ in which he listed the characteristics of Basket Maker II, Basket Maker III, Pueblo I, Pueblo II, Pueblo III, and Pueblo IV in northeastern Arizona. The Pueblo I house type was still indefinite, slab-walled semisubterranean pit houses are listed, and "square cornered rooms loosely grouped, built of adobe or stone above ground, occur in caves and in the open."¹⁵ The quoted passage includes almost any sort of above-ground building, in almost any sort of arrangement.

The statement under Pueblo II in the house type section is as follows: "No data, probably further development of architecture preceding period." It is interesting to follow down the list in the Pueblo II column. Exclusive of skeletal comparisons, 13 characteristics are compared. In 12 of them the entry for Pueblo II is "No data." The one exception is pottery, under which the following is entered:

"Data uncertain. The author believes the following will hold.

"Plain gray, plain and corrugated neck coils pls. 66, 42, 43.

"Black-on-white decorated.

"Black-on-red decorated, difficult to distinguish from black-on-red of preceding period.

"Decorated ware characterized by broad treatment of design."¹⁶

This little information that Guernsey was

willing to advance as "Data uncertain" failed to help in clarifying the problem. The culinary ware of plain gray with or without corrugated neck coils seemed to include the unpainted wares of both Basket Maker III and Pueblo I in the Roberts Classification. As usual, black-on-white pottery was mentioned as present, with no further details given.

One might well wonder why the Pueblo II column was included when no evidence of the existence of such a period could be put into it. The explanation lay in the general belief that Pueblo culture passed through a stage which should be classified in that position and that subsequent excavation would fill in the blanks. In fact, when Guernsey was preparing the table of differences just cited, he discussed with A. V. Kidder and Donald Scott the desirability of leaving out the Pueblo II column altogether. After extensive consideration, it was decided to leave it in for the purpose of emphasizing the meager knowledge of that period in the Pecos Sequence. These blanks are emphasized in this introduction not to cast discredit upon men who have done valuable work but to show the need of further work along the same lines.

Finally, in 1932, Roberts¹⁷ emphasized the tendency of house types to lap over into subsequent stages and did not attempt to attribute any one house type to Pueblo I. Also he divided Pueblo I into an eastern and a western phase; the former extending from the northeastern San Juan Basin (Piedra, etc.) in southern Colorado to the Upper Gila region in southern New Mexico and from the Rio Grande to approximately the Arizona-New Mexico boundary with some penetration into Arizona in the south. The latter (western Pueblo I) "ranged from northeastern Arizona

¹³ One of the difficulties here, an extremely common one in classification schemes, arises from the apparent belief that every period or phase must have a *single* house type. If we wish to make cultural groupings as extensive as these under discussion, we must adopt a concept of contemporaneous multiple house types. This is particularly true if our periods are conceived as applying to an area of varied environmental conditions. It can be true, however, in a single village or archaeological site. We encountered an excellent example on Alkali Ridge. Most Pueblo house types used in the schemes we are discussing are essentially wall types, as the terms Slab House, Jacal House, and

Coursed-masonry House imply. In the large house at Alkali Site 13, we found 3 of these in a single room, 2 in a single wall. One wall had a base of upright slabs and a superstructure of alternating courses of stone and adobe; 1 wall was of jacal construction of upright posts and adobe mud; and 1 wall consisted of alternating courses of stone and adobe throughout, all three in a single room (see pp. 192-93). Also, see pages 215-17, for further discussion of house type and taxonomy.

¹⁴ Guernsey, 1931, pp. 114-19.

¹⁵ Guernsey, 1931, p. 114.

¹⁶ Guernsey, 1931, p. 118.

¹⁷ Roberts, 1932.

south to the Little Colorado River, in the eastern part of the state, swung a bit south of that stream farther west, and continued across to southeastern Nevada." The "cultural center" of the latter was the Kayenta district. This division was based solely on the chemical composition of the paint on black-on-white vessels. It appeared that iron paint was characteristic of eastern Pueblo I, while carbon paint was used in the western Pueblo I area.

The statement of Pueblo II was very short: "Pueblo II was the unit-house period, which was marked by widespread distribution of life in small villages. The type forms of structures for this stage are found in the nuclear region along the San Juan."

It was at this point that the Peabody Museum Southeastern Utah Expedition began its work. In the summary, previously given, of the known and assumed development of Southwestern cultural sequence, the major weaknesses are fairly obvious. Pueblo II was the weakest; Pueblo I was still very confused; and the relationship of Basket Maker and Pueblo was shrouded in considerable haze.

The question of Pueblo II was the primary undertaking of the expedition. Was there a long enough period of time between standardized (?) Pueblo I and standardized Pueblo III wherein the culture should not be satisfactorily classified as one thing or the other but stood out with a sufficient quantity of distinctive traits to justify classification as a major division in the Pueblo sequence?

When remains of the earlier periods were uncovered on Alkali Ridge, other problems pertaining to the Basket Maker-Pueblo relationship and further definition of the earliest Pueblo Phase (Pueblo I) also became important to the expedition. Among the new classificatory problems were the following.

Of greatest importance historically: was there really a Basket Maker culture group in the Southwest which was invaded, attacked, over-run, or conquered by an alien group, basically different both culturally and physically?

If the above should prove true, when actually did this occur?

Should part of the apparently diverse Pueblo

I period be added to the hind-part of Basket Maker III and/or the fore-part of Pueblo II?

How much of the Pueblo I diversity is geographical?

These are only the broader problems; the many minor ones which bear upon them will appear in the body of the report.

Since 1931-32, during the time when the Southeastern Utah Expedition was in the field and subsequently, while this report has been in preparation, a number of new developments have arisen. Some of these have been attempts to clarify or solve the problems stated above. Others have been new discoveries and new ideas which have, for certain parts of the Southwest, revised or negated the Pecos Classification and demonstrated that, insofar as it is usable, it applies in its entirety only in the San Juan. A quite distinct culture, the Hohokam, has been set up in southern Arizona. Two other cultural groups have been put forward as non-Pueblo, the Mogollon and the Patayan (Yuman). These are by no means so clearly defined as the Hohokam as yet, but they are of importance to the problems of this report, because they lie, in part, nearer to the San Juan than does the Hohokam. All three may be looked upon as potential cultural reservoirs from which may have flowed some of the influences for change in the San Juan Pueblo culture. The important factor here, beyond the validity of assumption of cultural individuality for the various groups, lies in the relative dating of the groups. The developments between 1931 and 1945 which seem to have a direct bearing upon the problems presented will be summarized briefly in the following pages.

The chronological presentation heretofore followed in this section will be abandoned now, and recent developments with regard to the Pecos Classification will be listed before the new "cultures," the Hohokam, the Mogollon, and the Patayan, are considered.

In 1935 Roberts published another survey of Southwestern archaeology.¹⁸ At this time he divided the archaeological cultures into 2 groups: the inhabitants of the plateau, Basket Maker-Pueblo; and the desert dwellers, the Hohokam. Specific characteristics of the for-

¹⁸ Roberts, 1935.

mer, only, will be dealt with in this paragraph. The great variation in house types in Basket Maker III-Pueblo I was still not fully stated; "Prudden Unit-type" houses were still listed as characteristic of Pueblo II; and large "terraced communal houses" were the only type presented for Pueblo III. The pottery was more fully described, especially for Pueblo I, than in any previous list. Many of the special characteristics of Pueblo II corrugated wares were mentioned, and the important observation was made that spiral coiling characterized this period in distinction from the previous construction technique of concentric bands. Yet the statement about Pueblo II painted wares, because of the lack of published excavations, was as indefinite as formerly.

Roberts concludes his summary with a 14-page commentary on general archaeological problems of the Southwest which should be read by all students in that field.

In 1937 Roberts published another summary. In addition to further consideration of the Basket Maker-Pueblo and Hohokam cultures, he included description of the recently formulated Mogollon culture and a brief statement of the nomadic and seminomadic tribes, including Folsom and other early cultures, Apache, Navajo, and Southern Paiute. Again, only his remarks about the Pueblo culture will be considered immediately.

In this paper¹⁹ he continued a tendency shown in 1935. This was to make the Pecos Classification more flexible in an attempt to adapt it to the many problems with which it has to cope. He also modified the concept of an invading Pueblo horde overwhelming the Basket Makers to include the possibility of a "gradual penetration in successive small bands."

The modifications of the Pecos System, first suggested in his article in 1935, were restated by Roberts in 1937, and the formal numerical period classification was dropped. The revision of nomenclature was as follows: the assumed Basket Maker I was dropped; Basket Maker II became Basket Maker; Basket Maker III became Modified Basket Maker; Pueblo I and Pueblo II were combined as Developmental Pueblo; Pueblo III became the Great Pueblo period; Pueblo IV was divided between Re-

gressive Pueblo and Renaissance; and Pueblo V became Historic Pueblo.

In 1939 another summary appeared, this time by Earl Morris.²⁰ He presented his conception of the Pecos classificatory periods as applied to the San Juan. It is the longest and most detailed definition of the periods yet published and is based upon roughly a quarter of a century's consideration of the problems and a considerable amount of excavation.²¹ This summary is of great importance to our work on Alkali Ridge, because many of the statements he makes, both of details uncovered and conclusions reached, agree with our findings.

In his discussion of the Pecos Classification he introduces a number of new concepts. His treatment of period diagnostics, partly because it is so much longer than previous attempts at such definition, is more fluid and less dogmatic. In addition he gives much more attention in detail to changes within the periods.

The most important of the changes from earlier listings have to do with architectural development. He presents here for the first time his belief that the main house sites of the Basket Maker II period were not in caves but in the open where the people lived in houses similar to the pit houses of Basket Maker III. Since then he has found such sites, in the open, near Durango.²²

For Basket Maker III he lists contiguous above-ground storage and living rooms in addition to pit houses, a type of structure previously classified as Pueblo I. For Pueblo I he gives the most complete range yet presented with detailed descriptions of walls of jacal, upright slabs, adobe turtlebacks, and *crude coursed masonry*.

In Pueblo II he disagrees with earlier classifications, calls the "Prudden Unit-type" houses Pueblo III and, in place of them, lists a smaller and simpler house of coursed masonry. He makes the definite statement that jacal and slab construction had been given up, but emphasizes the lack of excavation. He expresses doubt as to the wisdom of giving this period equal classificatory status with Pueblo I and Pueblo III. He also attributes definite styles of painted pottery to Pueblo II.

The most striking change in period diagnos-

¹⁹ Roberts, 1937.

²⁰ Morris, 1939.

²¹ See pp. 24-25 and pp. 203-26.

²² See p. 29.

tics suggested by Morris has to do with house types in Pueblo III. While taking cognizance of the "great houses" which have always attracted attention, both in the caves and in the open in the Mesa Verde area, he believes the standard house type for Pueblo III to be none other than the "Prudden Unit-type," and he presents good evidence to support his belief. With regard to pottery he considers the entire specialized development of the Mesa Verde style to be in Pueblo III. This includes the type known as McElmo Black-on-white as well as the Classic Mesa Verde Black-on-white.

At first glance it seems that Morris has added to the confusion, but I believe the reverse to be the case. His detailed developmental presentation, based on excavated material, provides the first usable published evidence to assist us in understanding the gap in the formal classification between Pueblo I and Pueblo III.

The present position with regard to the Pecos Classification is, then, somewhat as follows. On the basis of the evidence at hand a chronological scheme has been devised which is intended to show the development of the native agricultural civilization of the Colorado Plateau, excluding, however, the Athabascan Navajos and Apaches, of presumably relatively late residence in the area, and the Utes whose presence is supposedly more ancient. The criteria by which the various periods are defined are in many respects unsatisfactory for the purpose, particularly with regard to the house types and pottery assigned to the periods, Basket Maker III, Pueblo I, and Pueblo II. This situation arises partly from lack of detailed stratigraphic evidence, partly from conflicting evidence in dated sites in different parts of the region, and partly from insufficient understanding of the nature and use of classification systems. Almost all of the known house types of the Pueblo culture have been attributed at one place or another to Pueblo I, pottery development obviously followed different lines in different areas, and even the basic criteria for distinguishing Basket Maker from Pueblo are

in doubt. Different students use different criteria and apply different weight to the same criteria in determining their period labels. Roberts says that the Pecos Scheme is not based merely upon pottery and house type or a combination of the two, but upon all discoverable cultural evidence, now bolstered up by tree-rings. Yet we can see in the reports that the application of the system by most students is based upon these criteria plus various interpretations of change in head form. *The situation is extremely unsatisfactory.*

Dissatisfaction with the Pecos System in practice has been expressed by a number of Southwestern archaeologists, and new systems have been devised in attempts to better the situation. Before proceeding further, we must stop to consider briefly these new systems, which have arisen largely from the attempts of investigators, in areas peripheral to that of the main Pueblo development, to fit their findings into the Pecos Classification.

At the Gila Pueblo Conference in 1931²³ Gladwin formally presented the Hohokam²⁴ culture of the Gila Basin as distinct from that of the Pueblo to the north and east of it. In this he gave formal statement to cultural divergencies mentioned by Holmes, Cushing, Mindeleff, Nordenskiöld, Kidder, Gifford, Kroeber, and others. Although many had realized that the Gila Basin material was quite different from that on the plateau, it had not been analyzed in terms of a culture complex until this time. Gladwin divided Hohokam development into 6 major periods: Pioneer, Colonial, Sedentary, Classic, Recent, and Modern. The last period included the Pima and Papago, present inhabitants of part of the region, who were presented as descendants of the Hohokam.²⁵ A great service has been rendered by Gila Pueblo in analyzing this material and particularly in excavating the large site of Snaketown.²⁶ Striking parallels with cultures in the Valley of Mexico appear in the later prehistoric periods, including numerous ball courts.²⁷ These parallels have now been found as far north as the region around Flagstaff,

to the inhabitants of "Desert Province," the valleys of the Gila and the Salt.

²³ Roberts, 1937, p. 15.

²⁴ Colton, 1939a. Hohokam is a Pima Indian word meaning "that which has perished." It was first used by Huntington (1914) for all prehistoric inhabitants of the Southwest and later restricted by Gladwin (1934)

²⁵ Gladwin, 1934.

²⁶ Gladwin, Haury, et al., 1937.

²⁷ Chard, 1940.

Arizona,²⁸ but they have not been observed in the San Juan.

Other work of note in the Gila Basin and to the south of it includes: (1) the excavation of the Grewe site, a Hohokam site, the specimens from which are now in the Los Angeles County Museum;²⁹ (2) excavations in the vicinity of Phoenix by the Pueblo Grande Museum;³⁰ (3) excavations by the Amerind Foundation in southeastern Arizona;³¹ (4) excavations by the University of Arizona under the direction of Emil Haury in the vicinity of Tucson and on the Papago Indian Reservation; (5) excavations by Isabel Kelly near Tucson.

In addition, E. B. Sayles and Ernst Antevs³² of Gila Pueblo Museum have recently been studying remains believed to represent very early pre-agricultural, pre-pottery-making cultures in the arroyos of southeastern Arizona. Haury, associated with this work while on the Gila Pueblo staff, has continued with outstanding success his search for early man since taking his present position at the University of Arizona. In Ventana cave, southwest of Tucson, he has uncovered what seems quite certainly to be the longest stratigraphic sequence yet found in the Southwest.³³ It extends from contemporary remains on the present floor of the cave down to a very early layer, bearing cultural remains which Haury calls Ventana-Folsom.

In addition to his work in the Gila Basin, Gladwin conducted the most extensive archaeological reconnaissance ever attempted in the greater Southwest, obtaining surface collections of potsherds and other materials from thousands of sites extending from Arkansas to California and from southern Utah to southern Chihuahua.

The potsherds obtained in this survey were classified according to a binomial taxonomic system and mounted on "sherd boards" in the Gila Pueblo Museum where they provide an excellent reference collection. Gladwin was extremely generous in supplying specimens from his surplus stock and copies of his distri-

bution map to institutions interested in his work.

Finding that the Pecos System did not provide the type of analysis he wanted, Gladwin devised a new classificatory system, based actually upon his pottery types, although theoretically having a broader base. This was a simple "family-tree" concept, with definite genetic implications. Nine "trees" were published in 1934.³⁴ They were arranged according to "roots," "stems," "branches," and "phases," and a combined chart of them all showed very little suggestion of interrelation, an archaeological illustration, perhaps, of the old adage, "couldn't see the forest for the trees." The forest, in this case, would be the complex cultural picture at any time with constant interplay of features; the trees, on the other hand, a tremendously simplified schematic representation of the assumed behavior of certain traits or groups of traits (in this case certain pottery traits). These charts impress one immediately as clarifying the picture, and they seem to give one ideas. On the other hand, they may be very dangerous in that the ideas presented may not be valid, and the relationships shown oversimplified to the point where they may be erroneous or useless. The difficulties in the taxonomic approach, suggested here, will be further developed in the next section.

One instance from Gladwin's phase chart, however, will illustrate the point. In that chart, which covers the whole Southwest, the Mesa Verde Pueblo II (Mancos Mesa Phase) and the Chaco Pueblo II (Wingate Phase) are 6 inches apart, which is half the width of the chart.³⁵ Furthermore, if the lines of "relationship" are traced, it appears that the closest connection between the two is at the very bottom, in the "Basketmaker Root." Wingate is on the Chaco Branch of the Little Colorado Stem, and Mancos Mesa is on the Mesa Verde Branch of the San Juan Stem. No one, looking at this chart, would suspect that these 2 "phases" represent material from sites in contiguous areas with a respectable overlap. Nor would he sus-

a diagram of the Ventana sequence at the third Round Table Conference of the Mexican Anthropological Society in Mexico City, August 25 to September 2, 1943. (Haury, 1943b.)

³⁴ Gladwin, 1934.

³⁵ Gladwin, 1934. Folding chart, not numbered, at very end of the paper.

²⁸ McGregor, 1937.

²⁹ Woodward, 1931.

³⁰ Halseth, 1934.

³¹ Fulton, 1938; Fulton and Tuthill, 1940.

³² Sayles and Antevs, 1941.

³³ Haury, 1943a, a preliminary statement. Haury is now preparing the main Ventana report. He presented

pect that even a professional archaeologist while looking at the sites in the field, or at the artifacts taken from them, would be hard put to tell the 2 phases apart. The cultural relationship is so close that no one has as yet attempted in formal publication to indicate where one leaves off and the other begins. Yet on the chart they appear entirely unrelated except for a basic connection at the very beginning, and this is the sort of distortion and oversimplification which is characteristic of the family-tree type of presentation.

In the tabular presentation, which precedes the chart just referred to, the Gladwin System was identified with the Pecos System by the interpolation of Pueblo "periods" into the "tree" between "branch" and "phase," except in the Hohokam "tree."³⁶ The actual chronological element is supplied by the Pecos Classification. The first significant column in the tabular presentations is the "period" one, with the periods then divided into 1 to 4 phases determined by pottery types. Thus the operative part of the Gladwin System is based directly on the Pecos Classification and uses its terminology. I present this point because so much has been made of the differences and antagonisms between these 2 systems.

The association of linguistic stocks with roots in this system, particularly the Caddoan, which gave rise to much comment at the time, need not be considered at this point. Except in their most fanciful speculations, Southwestern archaeologists have abandoned for the present the practice of attributing specific languages to prehistoric peoples.

It is interesting to note that the Gila Pueblo (Gladwin) System was being developed at the same time that the McKern System was being worked out in the Middle West. There is much similarity between the two, as will appear below. The main point of difference lies in the fact that the Gila Pueblo System includes a time-scale explicitly, while the McKern System tries to avoid doing so.

The aspect of Gladwin's work which had the greatest immediate effect upon thinking in Southwestern archaeology was his dating of the early Hohokam phases.³⁷ Vahki, the earliest

of these, he assumed to have been in existence in 300 B.C., and at first, before the development of the Mogollon concept, he believed the Hohokam to be the original pottery-making agricultural civilization in the Southwest, from which all others, including the Pueblo, obtained all major "civilizing" influences.

During the latter half of the 1930's another cultural concept appeared in the Southwest, arising primarily from the work of Emil Haury, at first under the auspices of Gila Pueblo Museum and later under the University of Arizona. Working in the region known as the Mogollon Rim, which serves as the physiographic boundary between the great Colorado Plateau and the Gila Basin, Haury excavated sites containing features similar to certain important diagnostics of both the Pueblo and the Hohokam cultures, as commonly defined. The problems raised by this work are closer to those of the San Juan than are the problems of the Hohokam, so that they must be considered in greater detail.

In addition to Haury's investigations 2 other important projects are in progress in this region, the excavations of Paul S. Martin³⁸ of the Field Museum, and Paul H. Nesbitt of Beloit College. The result of this activity is the tentative presentation of another major Southwestern culture, called the Mogollon,³⁹ which bears close architectural similarity to the Basket Maker III-Pueblo I complex of the North and certain ceramic similarity to the early phases of the Hohokam in the Gila Basin. The questions raised can be divided into 2 groups: the first largely a taxonomic one as to whether the differences are of sufficient magnitude to permit the assumption of a "culture" in terms of the Pueblo and the Hohokam; the second a chronological one as to the dates of the occurrence of certain traits in the Mogollon region in comparison with the plateau and the Gila Basin. There are those who believe, now, that the Mogollon was the first pottery-making group in the Southwest and that the pottery technique associated with the Vahki Phase of the Hohokam was obtained from the early Mogollon. Discussion of the Mogollon question will be found on pages 74-85, 292-94.

³⁶ Gladwin, 1934.

³⁷ See pp. 60-61, for discussion of the Hohokam dates and Gladwin's revision of them.

³⁸ Martin, Rinaldo, and Kelley, 1940.

³⁹ Named for the Mogollon Rim, Gladwin, 1934.

Finally, a fourth culture has now been presented to take its place beside the Pueblo (Anasazi), Hohokam, and Mogollon. This is the Patayan, described by H. S. Colton.⁴⁰ Its locale is on the western edge of the region we call the Southwest, beginning in the Flagstaff region and in the western end of the Verde drainage and running to and down the Colorado River. It includes the "Yuman" root of the Gila Pueblo System,⁴¹ and Colton has very wisely applied a new name in order to avoid the difficulties inherent in the use of linguistic terms for prehistoric cultures.⁴² The earliest date as yet assigned to Patayan is on the basis of pottery correlations in the Cerbat "Branch." Colton believes that Cerbat Brown ware, which he considers diagnostic of this Branch, was made from before 700 A.D. to between 1000 and 1100 A.D.⁴³

Along with the presentation of the Patayan culture, Colton published a new scheme of cultural classification. He has been directing intensive research in northern Arizona, and his "Prehistoric Culture Units and their Relationships in Northern Arizona"⁴⁴ classifies the various local manifestations of prehistoric cultures from the Chinle Valley to the Colorado

River in western Arizona. His system is an adaptation of the Gila Pueblo Classification with the substitution of the "focus" of the McKern System for the Gladwin "phase" and the addition of the McKern "component" to describe the situation at a particular site. This paper, E. K. Reed's⁴⁵ review of it, and Gladwin's critique of it⁴⁶ should be read by all students of Southwestern archaeology. Again, for the reasons stated in the paragraph to follow, a full discussion of the details of the new presentation will be deferred until later in this report.⁴⁷

It now becomes apparent that we can not proceed further in our attempt to summarize, practically, the present situation in Southwestern archaeology without considering seriously the methods by which these various and somewhat conflicting presentations have been constructed. We are dealing here with a series of taxonomic techniques, and before trying to synthesize them, we must study the philosophical concepts upon which they are based. They are all conceptual schemes and they vary considerably in clarity, in usefulness, and, if the word may be used, in validity.

⁴⁰ Colton, 1939a.

⁴¹ Gladwin, 1934.

⁴² "Pataya is the Walapai name for 'ancient people.' Patayan is the adjective." Colton, 1939a, p. 10.

⁴³ Colton, 1939a, p. 24.

⁴⁴ Colton, 1939a.

⁴⁵ Reed, 1940.

⁴⁶ Gladwin, 1943.

⁴⁷ See pp. 76-78.

THE USE AND ABUSE OF TAXONOMY¹

Scepticism is a powerful aid to scientific thought. One must be bold enough to cast doubt both upon the theories of others and upon one's own, and even upon the foundations of one's own science and its method.

— TALLGREN

DEVELOPMENTS during the last 10 years make it apparent that the time has come for a general consideration of cultural classification and taxonomic determination, or systematics, as applied to archaeology. In a few recent articles, particularly by Kidder, Roberts, and Kluckhohn, critical discussion of our current Southwestern systematics has appeared. With the exception of the last named, this, however, has been very limited, largely because included in short papers or in introductions to monographs. A few writers have referred to difficulties in the application of systematic methods but have tacitly or expressly passed them off as unworthy of discussion longer than a few sentences or paragraphs. With this I do not agree. The present condition of archaeological research in the Southwestern field leads me to believe that a thorough and careful examination into the mechanical processes of classification, and into the logical assumptions behind it, is not only desirable but necessary.

When the reader has finished this section, I hope that I shall not be considered presumptuous in stating that a perusal of much of the recent archaeological literature of the Southwest leads me to believe that many archaeologists do not fully understand the meaning, applications, and technique of systematic analysis. I hasten to add that I do not claim a complete grasp of it myself, but I firmly believe that it does not and can not do some of the things archaeologists seem to expect of it.

This is a statement which probably needs defense at the outset. That defense is simple and I believe forceful enough to justify the

rather lengthy consideration which follows. It is, merely, that in biology, from which most of our systems are borrowed or adapted, the problems of taxonomic method are by no means settled, and much of current biological literature is occupied with attempts to solve those problems and to determine just what such techniques will and will not do in that branch of science.

Professionally, we are dealers in conceptual schemes, and we must keep before us at all times the realization that we are dealing with them. When a student says "Pueblo II," or "Mogollon," or "Vahki Phase," and fits cultural traits into them, he talks in terms of arbitrary concepts, and not of "objective realities."

These concepts we must have. We can not get away from them because they are inherent in our processes of thought. They are the terms in which we think. In other words,—and here I address myself to those among us who express distrust or disapproval of what they call "theory" as opposed to "fact"—we can not get away from theory. We all use "theory," whether we admit it or not, *in all we do, in all our thinking*. Consequently, if we are not to waste our own time and that of others, we must analyze and attempt to understand it.

It is unfortunately the case, recently ably demonstrated,² that while archaeologists are becoming more and more proficient in the gathering and presentation of "facts" they, for the most part, do not seem to have much understanding of the concepts which of necessity

¹ Taxonomy — "Classification, esp. in relation to its general laws or principles; that department of science, or of a particular science or subject, which consists in or relates to classification": definition in *A New English Dictionary on Historical Principles* (The Oxford English Dictionary), Sir James A. H. Murray, ed., Oxford, 1919. Some confusion has arisen in archaeological discussions from the practice, common east of

the Rockies, of restricting the term "taxonomy" exclusively to phylogenetic or pseudo-phylogenetic classifications. It is herein applied in its basic meaning to all classifications. By those who use the restricted definition the title of this chapter should be read as "The Use and Abuse of Classification."

² Kluckhohn, 1939b.

must be built up with those facts to give them significance.

This is not an attack on taxonomic methods as such. It is not an attack upon classificatory analysis of specimens or of culture complexes. It is a fervent plea for a better understanding of these methods and for scientific use of them.

The objections which I shall raise to parts of our current procedure are of such a nature that, when clearly presented, they are usually admitted by most workers in the field. I contend, however, that the publications show that many archaeologists who in oral discussions admit the validity of these objections and recognize the limitations of their techniques do not carry those realizations into their actual work when they are deep in the analysis of their material.

In this connection I shall quote from a recent article on theory in anthropology,³ which in America includes archaeology. "In any case the alternative is not, I think, between theory and no theory or a minimum of theory, but between adequate and inadequate theories, and, even more important, between theories, the postulates and propositions of which are conscious and which hence lend themselves to systematic criticism, and theories, the premises of which have not been examined even by their formulators. For I am afraid that many of our anthropologists who are most distrustful of 'theory' are like Molière's character who spoke prose without knowing it, for a complex theoretical viewpoint is usually implicit in some of the most apparently innocent 'statements of fact.'"

What I suggest, then, is a critical examination of our own thinking, including those archaeological concepts which at any given time we consider as "basic" or "established." Another quotation from the author cited above is appropriate here. "While in certain aspects of scientific investigation it is absolutely necessary we should take certain things for granted, it is equally necessary that at other times we should consider our subject, coming as close as we can to taking nothing for granted."⁴ The first part of this sentence is of supreme importance to our work. In building up a "theory," an "argument," an "historical reconstruction," we must make assumptions, must take certain

things for granted. But we must also realize that we are doing so. We must know what we are assuming. And furthermore, it is our professional obligation to state those assumptions so that our readers may understand them, too. Otherwise we may mislead the reader. We shall be open to misconception, and, through this misconception, our work may be submitted to criticisms which would be unjustified were our assumptions clearly stated.

The quotation continues: "We must be eternally on guard against the insidious crystallization of dogma (unrealized as such) at the expense of that freshness of outlook which is surely a prerequisite to real scientific discovery." To maintain such a guard is extremely difficult, particularly for those of us who are also teachers. As teachers we must present our subject to untrained minds and in such a way that the enthusiasm of the beginner is not stifled and in such a way that he does not give up in disgust with the observation, "These archaeologists apparently do not know anything."

This is certainly not easy. During my first year in college, in a course designed to blast preconceived opinions and provide an introduction to science and scientific procedure, I was told to take nothing for granted. Yet a large part of my subsequent instruction, as an undergraduate, was nothing more than a piling up of dogma. That most of this dogma was arbitrary in nature was very rarely so much as intimated. In a large measure this report is an attempt to alleviate that situation in a way which may prove useful.

The primary problem has already been stated. There are certain very definite things which a student can accomplish by means of taxonomic studies and there are other things which can not be done by such means. It is the latter group which is perhaps of most importance to us in 1945, for the failure to realize the limitations has created a large number of totally unnecessary problems in Southwestern archaeology which will take years to straighten out, thus occupying the energies of students who might otherwise have been more gainfully employed. I refer here, among other things, to the waste of time, energy, and space in publications spent in disputes as to the placing of a

³ Kluckhohn, 1939b, p. 330.

⁴ Kluckhohn, 1939b, p. 342.

given trait in "Pueblo I" or "Pueblo II," the "identification" of a potsherd as belonging to one type or another, and, perhaps most important of all, the attempts to place cultural material, that is to say, specimens, in a single taxonomic system which will describe them completely and solve the problems of relationship in *one* operation. In order to show these limitations, it will be necessary to examine the very foundations of classificatory analysis.

The main points which this examination will attempt to establish are easily stated and had best be mentioned briefly here at the outset of the dissertation. Perhaps the basic one is the most readily admitted and the most thoroughly ignored of all; namely, that classificatory systems are merely tools, tools of analysis, manufactured and employed by students, just as shovels, trowels, and whisk brooms are tools of excavation. Upon this concept a number of others depend:

1) The system is "made" by the student, the diagnostic criteria are defined by him, and objects or cultures are placed in a particular class or type according to his designation: therefore:

2) Cultures are not "discovered," "types" are not "found." The student does not "recognize" a type, he *makes* it and *puts* the object in it. Objects do not "belong" or "fall into" types, they are *placed* in types by the student. Developing from this it can be stated that:

3) No typological system is actually inherent in the material. Systematic classifications are simplifications of and generalizations of the natural situation. The classes are entities and realities only in the minds of students, they have no other existence. Consequently:

4) There is no such thing as *the type* to which an object "belongs." The full implication of this is that:

5) There is no naturally or divinely created classificatory system in which the objects all have a place, so to speak, *ex officio*. This is of particular importance when considering attempts to design, let us say, a single taxonomic system into which all pottery may be placed, irrespective of the particular characters such as form, design, surface treatment, or paste composition being studied. Attempts to set up and use such a system introduce a series of insuperable difficulties which can best be stated by an example: given 100 potsherds for analy-

sis from a stratigraphic level in a site. These may be grouped according to determinations of paste composition and placed thereby in 4 classes of 40, 30, 20, and 10 individuals, respectively. Then let us jumble them together again and classify them by certain criteria of surface finish, again for shape, again for design or any other series of characteristics. Do they "fall into" the same groups? Those who have handled such specimens can answer this immediately. Usually they do not! This brings our first positive conclusion as to the proper use of classification, namely:

6) A group of objects to be studied must be classified in a number of different ways depending upon the information the student wishes to obtain, and generally the classes will not coincide. The negative corollary to this is:

7) A student whose purpose is to find out all he can about his material restricts his findings to but a small amount of the possibilities when he uses only one classification.

Thus at the end of the first avenue of the subject explored we come to the conclusion that we advocate not less but *more* classification of a given series of objects, specifically more than one classification. The classifications, however, are personal to the student and his problem and are conditioned by the nature of the information he seeks to extract from his series.

The second avenue of thought to be followed throughout this discussion is perhaps not so clear-cut and straight. It has to do with a serious misconception, again denied as such, but continually used in practice. This is that relationships exist between cultural objects and between culture complexes which are either the same as or similar to the genetic relationships between living organisms. That this concept exists in the minds of many archaeologists is again apparent in their publications. It can be demonstrated, I believe, that it is fostered by the way in which systematics has been applied or, more specifically, by the misuse of systematics arising from a regrettable disregard of the fact that we are dealing with inanimate objects. This arises naturally because, as already stated:

8) Our systematics has been borrowed and adapted from biology. In this connection it will subsequently be shown that:

9) The authors of most of the outstanding classificatory systems in the Southwest were at one time biologists or received their early scientific training in a biological discipline. This will not be presented as a criticism of their attempts to apply their training to the new subject but, rather, as evidence providing a logical explanation of a source of this particular difficulty. Because of this:

10) Cultural material has been thought of and discussed in terms of kinds of relationships impossible in the nature of the material; and because of this:

11) There has been a tendency to ignore or subordinate certain relationships and phenomena which do exist. As J. H. Steward says in a recent review of Colton's adaptation of the Gila Pueblo Phase System: "It is apparent from the cultural relationships shown in this scheme that strict adherence to a method drawn from biology inevitably fails to take into account the distinctively cultural and unbiological fact of blends . . . between essentially unlike types. . . . The inherent inability of this method to take cognizance of cultural blends is not surmounted in its application to archaeological data; it is ignored. . . . Those of us who have ventured to question taxonomic methods in archaeology are suspected of having disorderly minds. Obviously, our objection is not to order but to the supposition that classification is synonymous with order. We do not see the advantage of simplification, even for the general student and layman, when the method employed inevitably distorts true cultural relationships. If the purpose is to represent the development, interaction, and blending of diverse cultural streams, surely one can find a method that does not require the wholly unsuitable categories of biology."⁵ It will also be shown that:

12) Serious doubt now exists that actual genetic relationships in biology are always properly presented in the taxonomic systems of that science. Consequently, it is absurd to expect that similar systems will show such relationships between objects which do not receive their characteristics through the transfer of genes; in other words, where actually such relationships do not exist.

Throughout the discussion the arbitrary nature of classificatory schemes will be emphasized and, I hope, established beyond doubt. The uses to which they may profitably be put will be presented along with considerations of their limitations. General problems of taxonomic nomenclature will be explored along with the difficulties encountered in establishing diagnostic criteria to distinguish groups and phases. And the dangers will be pointed out, in the so-called ideal or comprehensive schemes, of overemphasizing single criteria or selected groups of criteria which, although of value in studying those particular characters, can not fail to give a warped picture of the whole.

In support of the various points to be made examples will be given and opinions will be quoted. The examples will, insofar as possible, be taken from archaeology; the opinions must perforce be quoted largely from the literature of biology because archaeologists, for the most part, have not turned their critical faculties in this direction.

I have mentioned before the necessity of examining the logical foundations of our work. Such examination should go on *all the time*, if we wish to be useful and to have our works withstand the increasingly critical judgments being brought to bear upon them, just as we continually examine the edge of a knife blade, the point of a drawing pen, or the effective member of any tool which we use. Because of developments in experimental physics and experimental biology, certain men engaged in these sciences have recently devoted themselves to epistemological studies, particularly to the manner in which scientists obtain their knowledge of the external world. A biologist, J. S. L. Gilmour, has recently published a paper which clearly shows the trend of these studies.⁶ I shall present the pertinent statements he makes about the nature of classificatory schemes, paraphrasing them to apply to our particular archaeological problems.

Citing H. Dingle,⁷ Gilmour believes there is a primary duality in our processes of obtaining knowledge. This consists of (1) a series of sense-impressions received through experience; (2) the mental processes which give order and

⁵ Steward, 1941a.

⁶ Gilmour, 1940, pp. 461-74. ⁷ Dingle, 1938, p. 148.

coherence to these sense-impressions. To quote directly from Gilmour: "This account of the thought-process gives an entirely different picture of the acquisition of knowledge from that usually accepted by working scientists. In both there is a duality. The commonly accepted picture is that of mind, on the one hand, and the objects of the external world, on the other, the business of science being to bring to the knowledge of mind an ever greater number of these objects. Mind in this picture plays no active part in *creating* the objects of the external world, but merely records what already exists. In Dingle's picture, however, the duality is not one between a passive, receptive mind and a pre-existing external world, but between an active, subjective, reasoning agent, and the countless sense-data of experience out of which reason builds that logically coherent pattern which we call the external world. The 'objects' of this 'external world,' therefore, consist of two distinct elements, one derived from sense-experience, the other supplied by the activity of the reasoning agent."

For example, a pot consists partly of a number of experienced sense-data such as color, shape, paste composition, and other qualities and partly of the concept *pot* which the mind of man has constructed to group these data together.

According to this, the process of classification is outlined by Gilmour as follows. The investigator experiences a large number of sense-data which he groups in classes, each defined in terms of certain specific data. Thus a class called bowls may be made for sense-data exhibiting a certain range of shape. Any series of data can be grouped in a number of different ways, depending on the purpose of the investigation. Thus the range of data placed under the class "pottery vessel" can be subdivided into colors, surface treatments, shapes, uses, and so on. The important thing here is that the making of these groups is an activity of reason and can and should be manipulated at will to serve the purposes of the student.

Concluding this argument Gilmour says: "Classification, then, has always a pragmatic element as well as an empirical and a rational

one. Broadly speaking, the purpose of all classification is to enable the classifier to make inductive generalizations concerning the sense-data he is classifying."

This starts us fairly upon a consideration of the purposes of classification. It also casts grave doubts upon the possibility of obtaining that ideal of archaeological systematists, the "objective" classification of pottery or the "objective" classification of cultures.

The desire for "objectivity" in classification arises, I think, from the belief that the manufactured groups are realistic entities and the lack of realization that they are completely artificial. Thus the desire is essentially a paradox. Implicit in it is a faith, based upon the species concept of biology, in the existence of a "true" or "correct" classification for all objects, cultures, etc., which completely ignores the fact that they are all part of a continuous stream of cultural events.

It will be well here to examine the species concept in the context in which it was developed. Doubts as to the validity of species as real entities are not new, but difficulties encountered by many experimental biologists and physiologists in applying the concept, particularly to the smaller organisms, have recently brought them to the fore. Early expressions of the arbitrary nature of species are to be found in Darwin's writings. He regarded the term as one arbitrarily given,⁸ and the furthest he ever went in his use of the concept was to regard species as "tolerably well-defined objects."

Later-day biologists have varied from complete denial of the concept to complete acceptance of it as representative of objective reality. E. Rabaud⁹ denies its usefulness and declares that the individual is of greater consequence than species. At the opposite extreme Bateson¹⁰ believes that "specificity" is a universal attribute of organized life. Most zoölogists and botanists now hold beliefs somewhere between these two. G. C. Robson in his book on the species problem says, ". . . while many of the groups called 'species' by the systematist are readily distinguishable one from another, there is no universal criterion by which species as opposed to other systematic

⁸ Darwin, 1859, p. 66. ⁹ Rabaud, 1920, pp. 291-93.

¹⁰ Bateson, 1913, p. 12.

units may be recognized.”¹¹ He believes the concept useful, though, for “. . . while there is no essential and absolute ‘specificity’ which can be attributed to certain assemblages of individuals, but not to others, the groups which the systematist treats as species have a tolerable degree of homogeneity. The systematic status of such groups is generally recognized as a *purely conventional matter*.”

One of the common definitions of species, still held by many zoölogists, is that a species is made up of individuals capable of fertile union.¹² This definition has been repeatedly shown to be impractical¹³ and, because of the difficulties of obtaining an acceptable precise definition, biologists are gradually adopting a generalized one very similar to that by which the more cautious archaeologists define their taxonomic categories; namely that a species, as a useful classificatory tool, is a group of individuals resembling each other more than they resemble the individuals of other groups.

The implications of this are important. The resemblances upon which the groupings are made must be observed by the classifier. The relative weight assigned to different characteristics of the individual vary and the particular interests of students vary as well. This view of the species problem does not arise from the study of such distinctive groups as the kangaroo and giraffe but from small organisms such as insects of which approximately 10,000 new species are currently being described every year;¹⁴ a situation somewhat comparable to that developing in the ceramic systematics of the Southwest.

Thus, from a survey of biological literature, it seems that the various taxonomic categories of that science, even the fundamental one of species, are arbitrary. The diagnostic characteristics of each group are selected by the student, the groups are arbitrarily defined by the student, and the student puts the individual in the group.

Similar conclusions have been reached by certain archaeologists in the Southwest and in other fields. Kidder in the introduction to the second volume of “The Pottery of Pecos” says,

“The division of the Glaze ware of Pecos into six chronologically sequent types is a very convenient and, superficially, satisfactory arrangement. For some time I was very proud of it, so much so, in fact, that I came to think and to write about the types as if they were definite and describable entities. They are, of course, nothing of the sort, being merely useful cross-sections of a constantly changing cultural trait. Most types, in reality, grew one from the other by stages well-nigh imperceptible. My grouping therefore amounts to a selection of six recognizable nodes of individuality; and a forcing into association with the most strongly marked or ‘peak’ material of many actually older and younger transitional specimens.”¹⁵

Irving Rouse in his study of the prehistory of Haiti¹⁶ defines “types” as artificial concepts and devotes a large part of his paper to definition of his conceptual scheme and discussion of its utility and significance.

Likewise, Colton, though frankly adopting a scheme based upon biological taxonomy, says: “It must be stressed, however, that this is not a ‘natural’ classification but is purely artificial. The very nature of the material presupposes this.”¹⁷

It seems, therefore, that we can conclude that the classes in these systems are artificial; that they are part of our own devices for interpreting our observations; and that it is incorrect to believe that objects or cultures “fall into” a given place in a system or that we are able to “discover” an artifact type or a culture phase.

If this can be admitted, and I believe it must be, then we can view such systems in a different light. The most important result of this conclusion is that, if the systems do not exist in objective reality, that is to say, naturally, we are under no historical or scientific compulsion to “discover” or “record” them. Thus the question becomes one of method, and we can concern ourselves entirely with evaluation of the usefulness of the various systems; a study of what they do for us, how they do it, whether a given system “does more harm than good,” that is, whether it introduces more problems

¹¹ Robson, 1928.

¹² Diver, 1940, p. 303.

¹³ Zuckerman, 1933a, 1933b.

¹⁴ Smart, 1940, pp. 475-91.

¹⁵ Kidder, 1936.

¹⁶ Rouse, 1939.

¹⁷ Hargrave, 1932, foreword.

than it solves, etc. In this regard, probably the most important part of the taxonomic technique is the way in which the various classes are defined, the criteria or diagnostics which are set up. These will be discussed at the end of the section when the specific application of this study to Southwestern archaeology will be made.

Before going on to a consideration of the genetic implications of current archaeological taxonomy, there is one more point which seems to merit further discussion. The fifth item in the list at the beginning of this section states that there is no ideal system of classification in which all objects or groups of objects have a place because of their natural characteristics. This is a very important consideration, for in recent years much time and energy has been spent in attempting to "find" or devise such schemes and in forcing objects into them. The attempts cover a great range of material, from fragments of artifacts, that is, potsherds, to large assemblages of traits called by various names such as "cultures," "periods," "phases," "aspects," etc.

Again I must emphasize that I do not criticize the manufacture of such schemes and their use in archaeological analysis and description. However, must we not condemn the practice of considering them as realities and above all of setting up one of many possible systems as the "true" classification of certain objects or of cultures?

This question, too, has been raised in biology; namely, is there a "final ideal classification towards which taxonomists are consciously or unconsciously striving"?¹⁸ In answer to this Gilmour writes: "A natural classification is that grouping which endeavors to utilize *all* the attributes of the individuals under consideration, and is hence useful for a very wide range of purposes. . . . In so far as it is theoretically possible to envisage a classification on these lines, which does in fact embody all the attributes of the individuals being classified, it can be said that one final and ideal classification

of living things is a goal to be aimed at. In practice, however, this aim would never be attained, owing both to the limitations of our knowledge and to the differences of opinion between taxonomists." I wish particularly to draw attention to the final statement. If this is true of biologists, who, after all, have in their hands the complete organism, how much more surely must it be true of archaeologists who deal, for the most part, only with fragments of objects or cultures. Even when the experimental biologist attempts to recreate natural situations of interaction between organisms he often feels that the behavior of his individuals is conditioned by the specializing factors of his laboratory set-up. With such exceptions as experimentation with pottery firing¹⁹ and with the reproduction of stone implements,²⁰ even these controls are denied anthropologists. Our discipline is for the most part nonexperimental.

With regard to "final-ideal-complete-classifications" we must step for a few moments into what might well be considered the realm of absurdity. I do not think it is, for the 2 questions I am about to pose are asked time and again in oral discussions and are really of great importance. They are: 1) If we attain a classification in which "*all* the attributes of the individuals under consideration" are utilized, shall we not end up, provided our information be complete, with a situation wherein each individual constitutes a class by itself? and 2) If we arrive at a complete classification of all living things, of all pottery "types," of all "cultures" in the world, then what have we, and what do we do with it?

The first question is a hard one to answer. I believe we shall err if we agree to dismiss it as absurd, because so many systematists in different fields have published statements which seem to mean just that, or else they mean nothing. The logical conclusion of their published aims can result only in a reduction to the individual object in the case of artifacts and to the individual person in the case of "cultures."²¹ Obviously there is something wrong

species one is impressed by the similarity of many of them in all but a few unimportant details. Some of the descriptions were so accurate that it would be difficult to find any tree or specimen except the type (specimen) that would fit them in every detail." Palmer, 1943, p. 374.

¹⁸ Gilmour, 1940, p. 461.

¹⁹ Shepard, 1936, 1939; Colton, 1939b.

²⁰ Pond, no date, ca. 1930; Ellis, 1940.

²¹ The appropriateness of the question is attested by the following quotation from a recent botanical report. "In reading the original descriptions of *Crataegus*

here and we need better definition. The usual answer to this criticism is in terms of "significant criteria." In studying the differences between individuals which differences are significant and which differences insignificant in terms of taxonomy? No general answer seems possible. Here again is a manifestation of the arbitrary nature of these systems. We must agree which differences are significant, and the significance will again vary with the student and with the nature of his immediate problem. Bateson in his "Problems of Genetics" ²² says: "They will serve Science best by giving names freely and by describing everything to which their successors may possibly want to refer, and generally by subdividing their material into as many species as they can induce any responsible journal to publish." This is an excellent and horrible example of the kind of thinking which brings discredit upon all scientific work and workers. If we follow Bateson we must describe our material according to the needs and interests of posterity, which we can not possibly know, and in the final analysis the arbiters of the number of our groups, of the size of our classifications, are our publishers! What folly!

The only answer I can reach for the first question is a tentative one and not an answer, really, at all, but a negation of the whole proposition. At present, it seems to me that the "ideal-complete-classification" is an impractical concept because of the impossibility of arriving at standardized criteria which can meet the needs of actual study of the material with a view to solving particular problems. As has been said above and will be said many times below, the diagnostics of classificatory groups are too closely associated with the immediate problem in hand to permit a general classification which can be generally applied to a heterogeneous mass of problems. Lothrop in a recent critique of taxonomy says: "... archaeological remains are human products, censored by destructive contact with the soil, and they therefore vary widely in quality and quantity. Furthermore archaeologists are individuals differing in character, training, ability and special interests. How then can there be

any one . . . method which outranks all others?" ²³

This verges upon the second question: if such an "ideal-complete-classification" can be worked out, what shall we have and how shall we use it? Some of my doubts as to its usefulness are already expressed. First let us consider what it is. By this ideal system we would have all of the pottery of the world, or the cultures of the world, arranged according to a single descriptive classification according to criteria arbitrarily agreed upon. This would be a nice orderly thing and to some workers, apparently, a sufficient end in itself. But what would it show? From it would appear certain real or fortuitous relationships, and I fear in most cases it would be impossible to tell which, based upon *the agreed criteria*. To establish other relationships and to check those suggested by the system itself it would still be necessary to reanalyze and reclassify the material according to other criteria. This would of necessity result in regrouping and in the production of various more limited classifications which would not conform to the basic one.

The famous McKern System (the Midwestern Taxonomic System) of culture classification in use in the eastern United States ²⁴ is, insofar as I am able to understand it, one of these "ideal-complete-classifications." There are those who claim that it has produced considerable order in the eastern field. On the other hand, it has also produced a tremendous amount of dispute, even acrimonious dispute, and confusion.

The most important single objection which has been raised against the McKern System is that its usefulness is greatly restricted or nullified by the ignoring of a time factor. Ford, with regard to his own system of classifying lower Mississippi cultures, ²⁵ says: "... it is impossible to see, without chronology, how we can ever hope to rediscover the cultural history of the Indians of the Southeast."

Rouse, who used the McKern System in his earlier work in the West Indies and then devised one of his own to supplement it, says: ²⁶ "... it will be seen, persistence is the logical counterpart to diffusion. One who traces the

²² Bateson, 1913, p. 249.

²³ Lothrop, 1941.

²⁴ McKern, 1939; see also pp. 18-21, *Bulletin, the*

Archaeological Society of Delaware, vol. 3, no. 3, 1940.

²⁵ Ford, 1938.

²⁶ Rouse, 1939.

distribution of a type or mode only in space, thereby studying diffusion but ignoring persistence, reconstructs only part of the culture history." And vice versa, "A person must study both the diffusion and the persistence of culture traits if he desires to make a balanced historical reconstruction." He does not consider the McKern System to be useless but merely insufficient for his purposes. He says: "The McKern technique made it possible to formulate static units of culture . . . and to point out the descriptive relationships between these units. The present technique (Rouse's system), on the other hand, has been used to reconstruct the history of certain individual traits of each cultural unit, and thereby to indicate how the traits changed from unit to unit. The dynamic nature of the present technique seems to have been a good contrast to the static character of the McKern classification."

The same point is brought out by Colton²⁷ in his "Prehistoric Culture Units and Their Relationships in Northern Arizona." He presents therein a system for classifying Southwestern cultures which is a combination of the Gladwin System²⁸ and the McKern System. Colton writes: "Although the various subdivisions of the Gladwin and McKern Systems seem superficially to be parallel, they really represent different dimensions of the same principle. The McKern System includes a horizontal or area dimension and omits time, while Gladwin includes area and a vertical or 'time' dimension as well. The two systems, therefore, are not parallel but one may supplement the other. . . . Since archaeology is history and history involves the idea of chronology, the most satisfactory system of classifying phases or foci is one that also involves time."

I cite these objections not as specific criticisms of the McKern System but as objections to the concept of an "ideal-complete-classification" for which I have taken the McKern System as an example. I realize that I have come far from exhausting the subject, but I merely wish to emphasize at this point that such systems do not serve the purpose for which they

seem to be designed but must be modified or supplemented to meet any particular problem. And when the modification is, itself, set up as an "ideal-complete-system" it, too, suffers from similar or other difficulties. For example, the current merger of the Gladwin and McKern Systems by Colton²⁹ introduces the Gladwin "family-tree" concept which had been carefully and consciously avoided by McKern.

All of the above, I believe, serves to illustrate my point, which is that the McKern Classification, designed as a world-wide "single-ideal-complete" cultural classification is impractical and useless as such. To be used at all, it must be adapted to specific problems by each worker (other examples of adaptation of the McKern System can be found in the archaeological literature of the eastern United States), and these adaptations when made, constitute merely one of the classifications the particular student uses in the study of his material.

Consequently, I feel that we must express grave doubt that the "ideal-complete-classification," though perhaps superficially attractive, serves a useful end. If, however, it is used, as the McKern System is actually beginning to be used by the most advanced students,³⁰ not as a "single-ideal-complete" classification but as merely one of a number of tools for the orderly presentation of a mass of data, then, indeed, it may be of value.

Since the question of the "family-tree" concept has arisen in connection with the Colton-Gladwin System above, it may perhaps be advisable now to get on with the second group of basic assumptions before attempting to analyze further the present systems.

The second major misconception I wish to discuss is that relationships exist between cultural objects and between culture complexes which are either the same as or similar to the genetic relationships between living organisms. Because of that belief, it has been thought, by some, that these relationships will "fall into" or can be described by taxonomic systems modeled after those of biological systematics.

In questioning the validity of this assumption I shall show:

²⁷ Colton, 1939a, p. 8.

²⁸ Gladwin, 1930.

²⁹ Colton, 1939a.

³⁰ Ford, Phillips, Rouse, Griffin, Krieger, J. Charles Kelley, etc.

1) That grave doubt has been cast *by biologists* upon the assumption that current biological taxonomic systems describe phylogenetic relationships.

2) That similar doubt has been raised by students in specialized fields closely allied to biology, such as palaeontology, conchology, and oölogy.

3) That it is impossible for such systems to show phylogenetic relationships between inanimate objects since (a) they apparently do not show them between living objects, and (b) because phylogenetic relationships do not exist between inanimate objects.

The statement that biological systematics does not actually record and describe evolutionary relationships will occasion more surprise to many archaeologists than it will to biologists. Among the latter it has long been a question for discussion. The more critical among them even go so far as to doubt whether the real significance of the term "phylogenetic relationship" is yet fully understood,³¹ and this is something to be kept in mind while we are considering the firmness of the ground upon which our archaeological systematics is based.

The purpose of this section, however, is not to argue the theory of evolution nor to discuss biological relationships. I shall merely present statements of current workers in biology which will be sufficient for my point and refer to their publications for the benefit of those readers who wish to go deeper into the matter.

In so far as this question affects biological taxonomy, it arises through the transfer by the student of the inheritance mechanisms of the individual to the taxonomic groups. In essence, it is a concept of group rather than of lineage phylogeny. According to Gilmour³² this arose from a false analogy between taxonomic groups and individuals and was based upon the objective existence which both were supposed to possess. From this analogy came the belief that there is a relationship between groups analogous to the genealogical relationship between individuals. Gilmour concludes his argument with the statement, "It is only when taxonomic groups are seen to be collections of individuals classed together because

of the possession of certain attributes in common that the falseness of the . . . analogy becomes clear."

This does not imply that members of a group are not physically related, since in most cases biological groups are composed of closely related lineages. The point made by Gilmour is that this is not always so and that it is not implicit in the system. Therefore he believes that phylogeny does not form the basis for the "single, ideal natural classification" but that it is actually one of the many "classifications constructed for the purpose of special investigations."

This position, as intimated above, is not new. In 1877, T. H. Huxley wrote,³³ "The things classified are arranged according to the totality of their morphological resemblances, and the features which are taken as the marks of groups are those which have been ascertained by observation to be the indications of many likenesses or unlikenesses." He definitely denied any attempt, on his own part, to base classification on phylogeny.

I shall cite only one other statement on the side of general biology. Those who wish to explore it further will find numerous bibliographic references in the papers already cited. Discussing the problem of the "origins of species" Lancelot Hogben says,³⁴ "We name assemblages as such for two reasons. One is discontinuity of pattern among living creatures. The other is that it is necessary to have a convenient card index of distinguishable types. The procedure we adopt in making it has little to do with *experimental inquiry* into the nature of hereditary variations; and there is no necessary reason for expecting a close connexion between categories of resemblance based on the architecture of the germ-cells and categories of resemblance appropriate to the practice of taxonomy."

Later in his paper³⁵ Hogben gives an example which is not only amusing but foreshadows some of the factors we must consider when taxonomy is applied to archaeology. "Several local 'species' of the dog family, like races of mankind, are interfertile products of geographical specialization. In so far as extrinsic

³¹ Gilmour, 1940, p. 461.

³² Gilmour, 1940, p. 471 *et seq.*

³³ Huxley, 1877, p. 23.

³⁵ Hogben, 1940, p. 283.

³⁴ Hogben, 1940, p. 269.

barriers separate them into distinct assemblages, they may be given taxonomic rank as species, and they remain so as long as the extrinsic barriers are there. So the taxonomic distinction is relative to a certain level of transport industry. In so far as this is so, the origin of dog species is less a problem of biology than a problem of economic history. The sterility of discussing the polyphyletic origin of man is analogous, and also illustrates how difficult it is to think clearly about matters which involve social preferences." At this point I merely wish to point out the possibly even greater role played by preference in the selection of a design to be painted on a pot. And it has a looser rein, for the preference in the latter case must needs apply to only one of the parties to the transaction.

Before going on I believe it will be useful to quote a few recent definitions of "species" published by biologists, as follows:

"A community or number of related communities, whose distinctive morphological characters are in the opinion of a competent systematist sufficiently definite to entitle it, or them, to a specific name."³⁶

"A practical and convenient unit by which fossils are distinguished."³⁷

"A species is a group of individuals which, in the sum total of their attributes, resemble each other to a degree usually accepted as specific, the exact degree being ultimately determined by the more or less arbitrary judgement of taxonomists."³⁸

All of these point one way, all of them exclude phylogeny, and all of them definitely state that the determining factor is the opinion of the classifier.

Many more citations could be made to the same end, but I believe these are sufficient to establish our right to question the assumption that biological taxonomic systems represent phylogenetic relationships.

There is one other biological concept, widely used by anthropologists and archaeologists which we *must discard*, even if we persist, as I hope we shall not, in using a system based on biology. This is the simple "family-tree" con-

cept by which the development of a graduated series of classificatory groups is represented by a diagram in the form of a tree, with parent stem, major forks, major and minor branches, etc.³⁹ The more critical biologists believe a diagram which is an interlocking network to be a better indicator of genetic relationships,⁴⁰ and perhaps a 3-dimensional diagram of this kind is an even closer approximation than a 2-dimensional one.

So much, for the present, for general biology. There are a number of very interesting scientific disciplines which are part way between pure biology and archaeology, in terms of the problem we are discussing. These are sciences which deal with certain characteristics of organisms without dealing directly with the organism in its entirety. I shall mention 3 of these in the natural sciences and 1 striking development in a field closely bound up with anthropology and history. First, palaeontology, where the scientist has only the fossil bones of the organism; second, conchology, where the student deals with the shell of the organism; third, oölogy, where the investigator studies the eggs of birds, especially their shape and color, in other words the visual, external characteristics of the temporary housing of the organism in its embryological stage; and fourth, a specialized study which has been made of medieval human armor.

In all of these cases I shall point out that, although classifications have been made and presented as representing evolutionary development, they do not necessarily describe or even parallel the phylogeny of the actual organisms.

Taxonomic troubles are not new in palaeontology. In 1927 F. A. Bather⁴¹ presented doubts that phylogeny is a sound basis for palaeontological classification. In 1931 C. E. B. Bredekamp⁴² denied that it is useful at all for this purpose. W. J. Arkell and J. A. Moy-Thomas have recently published a detailed consideration of the problem⁴³ from which I shall quote at some length because much of the difficulty they experienced is present in archaeological systematics. With regard to traditional procedure in palaeontology they say,

situation presented in such charts is given on pp. 41-42.

⁴⁰ Calman, 1940, p. 457.

⁴¹ Bather, 1927, p. lxii.

⁴² Bredekamp, 1931.

⁴³ Arkell and Moy-Thomas, 1940, pp. 395-410.

³⁶ Regan, 1926.

³⁷ Arkell and Moy-Thomas, 1940, p. 395.

³⁸ Gilmour, 1940, pp. 468-69.

³⁹ An example of the distortion of the cultural

"The method of classification now used by the majority of palaeontologists is the phylogenetic one, in which fossils are arranged as nearly as possible in accordance with the supposed course of their evolution. Thus classification has come to aim, not only at providing an easy means of recognizing fossils, but also at giving a summary of existing knowledge of phylogeny. It is because these dual objects frequently tend to produce conflicting results that the problems of taxonomy have arisen." This conflicting duality will be understood by those who have attempted to use the recently developed ceramic taxonomy of Southwestern archaeology. The latter aims not only at providing an easy means for recognizing pottery and for placing the specimens in time and space, but also at providing an outline for the development of cultures and the movement of peoples.

The next statement I shall quote from Arkell and Moy-Thomas is equally applicable to archaeological systematics. The palaeontologist is "torn between two irreconcilable endeavors; for as a phylogenist he strives to reveal closer and closer relationships, while as a systematist he must point out differences and divide up his material into units bearing distinct names." Here we have a statement of the basis of the conflict between the so-called "lumpers" and the "splitters" in archaeology which will be treated more fully later.

The crux of the palaeontologist's difficulty is expressed in the next quotation. "It is part of the paleontologist's business to unravel phylogeny by the study of fossils; but he can only arrive at an approximation to the truth, for he has only a fraction of the material to work on, the hard parts which alone have been preserved by fossilization." Even if we disregard for the moment the fact that objects of material culture are not sexually reproductive, I believe that the reader will agree that this objection applies equally well to systematic schemes built upon a study of potsherds.

Because of this situation, these 2 palaeontologists feel free to state that: "At the best of times his (the palaeontologist's) results are hypothetical and more or less subjective, and

it may be questioned whether such results form a suitable foundation on which to build a classification and a nomenclature."

If this is true in the case of fossil bones it is even more obviously the case with the shells of mollusks. That the morphology of these shells, arranged in a taxonomic classification, does not parallel the morphological classifications of the organisms which inhabit them has been sufficiently demonstrated.⁴⁴ An interesting analogy might be drawn here between the development of house type and the evolution of human beings.

In oölogy I believe the disparity between the classificatory system and the genetic history of the organism is even more apparent. The differences in eggshells are even more minute and the range is smaller than in the shells of mollusks, while the differences in the organisms, in this case birds, are more gross and the range is greater. In any case, the same arguments apply and I think we must conclude that classifications of form and color of birds' eggs do not "reveal" genetic relationships between groups of birds.

The fourth case is of a different nature but is inserted here to help in the transition from "natural" to "cultural" objects. Bashford Dean was an ichthyologist whose interest led him to specialize in armored fishes. From that the step to human armor was made, and it is natural that Dean carried with him into his cultural study the taxonomic system he had learned in his biological work. The result is a series of amazingly detailed "family-trees" of armor which are published in the catalogue of the Metropolitan Museum in New York,⁴⁵ and which are used by T. H. Morgan to illustrate certain points in his critique of the theory of evolution.⁴⁶ The epistemological fallacy here is quite apparent. The only defense there can be for a classification of armor based upon phylogenetic theory is that the individual objects were made and used by man. Yet the connection between the object and its user is even less close than that between the shell and the mollusk or between the egg and the developed bird. And since this correlation does not exist, then armor has no phylogeny and a

⁴⁴ Arkell and Moy-Thomas, 1940, pp. 397-410.

⁴⁵ Dean, 1916, pp. 115 and 137.

⁴⁶ Morgan, 1916, pp. 4-5.

"family-tree" classification is not only meaningless but actually misleading.

This brings us close to one of the most dangerous examples of complaisance I have encountered among archaeologists. I refer to the use of biological concepts and terms with the knowledge that they do not apply. This means one of 2 things: either the concepts and definitions must be greatly modified for archaeological usage or else they are in fact either meaningless or false. Such usage is perhaps worse than in the case of the workers who really believe that biological rules of taxonomy are absolute and that they do apply to cultural matters. For it means that the user is either lazy or indefinite in his pursuit of knowledge.

In this connection I would, had I sufficient faith in the probability, express the hope that I should never again hear or see the term "evolution" applied to an artifact or to a "culture." I hasten to state that I realize that many humanists and historians who use this term do not imply by it genetic relationships. Of them I ask, in that case, of what use is the term? And I further charge them with this responsibility: that, even though they do not intend such implication, the general association of the term with the genetic history of living organisms leads their hearers and readers to make such implications themselves, to the detriment of progress in the understanding of cultural development.

I also wish to state that I realize that the phylogenetic implication has been added to the word "evolution" by the biologists and that the first meanings given in most dictionaries are of such general nature as to permit the term to be applied to cultural development. My interests, however, are in the ideas which the use of the term brings forward in our minds. In other words, I believe the recent modification of meaning introduced by biologists to be so widely accepted that, if we wish to free ourselves entirely from genetic concepts false to the processes we are studying, it will be necessary to abandon the application of the term to inanimate objects.

In support of this plea I shall quote again from the biologists who are responsible for the present specialized meaning of the word. T. H.

⁴⁷ Morgan, 1916, p. 4.

Morgan, in his critique of the theory of evolution, says: ⁴⁷ "There is an obvious and striking similarity between the evolution of man's inventions and the evolution of the shells of molluscs and of the bones of mammals, yet in neither case does a knowledge of the order in which these things arose *explain them*." I have added the italics. This is a most important point, and I wish to emphasize here that one of the leading proponents of the biological theory of evolution does not believe that it, or a taxonomic system based upon it, can be usefully adapted to the study of fossil bones, shells, or the cultural products of human beings.

In criticizing general usage of the term "evolution," Morgan writes: ⁴⁸ "We use the word evolution in many ways—to include many different kinds of changes. There is hardly any other scientific term that is used so carelessly—to imply so much, to mean so little.

"We speak of the evolution of the stars, of the evolution of the horse, of the evolution of the steam engine, as though they were all part of the same process. What have they in common? Only this, that each concerns itself with the *history* of something. . . . Clearly no more (in common) than that from a simple beginning through a series of changes something more complex, or at least different, has come to being. To lump all these kinds of changes into one and call them evolution is only to assert that you believe in consecutive series of events (which is history) causally connected (which is science)." Morgan concludes that our aims as scientists should be to find out actually what kind of causes produced the stars in the heavens and the steam engine in the mind and works of man. To confound these causes with the genetic mechanisms which have produced the modern horse does not assist that aim.

It has now been shown that many competent biologists do not believe that the taxonomic system is a proper tool for describing genetic relationships in living organisms. It has also been shown that the use of taxonomic systems for this purpose in the fields of palaeontology, conchology, and oölogy has been questioned by some of those who, nevertheless, believe it is a useful tool in descriptive biology.

⁴⁸ Morgan, 1925.

If there is, as there certainly seems to be, a reasonable doubt of the usefulness of phylogenetic classification for fossils, how much greater must the doubt be of the usefulness of a pseudo-phylogenetic classification of artifacts and cultures.

The defense has been offered that such systems are useful, because artifacts and cultures are made by man and closely associated with man, who as an animal is subject to the processes of phylogeny. This can be most effectively exposed as false in 2 ways. 1) The arguments presented above in the case of conchology, etc., apply even more patently to cultural objects. In other words, although the objects were made by man, there is no necessary or causal connection between the form of the object and the shape and color of the man. 2) It may also be effectively pointed out in this connection that although the objects were made by men, the classifications were not made by the same men. And, although the archaeological "cultures" are simplified expressions of life led by men, those expressions were not made by the men who lived the "cultures." A number of ideas (probably most of them) in such classifications were not present in the minds of the makers of the objects and the possessors of the "cultures." This is admirably stated by Rouse⁴⁹ in the following quotation: "If the aborigines had been trained to think in cultural terms, they might possibly have conceptualized the artifacts in terms of community standards of behavior, as the writer has done. It is not within the power of the writer, however, to determine whether or not they did so. He can only assume that the types and modes are products of his own mind, whereas the artifacts were objects made by the aborigines."

Consequently, since the relationships are expressed in terms of these classifications produced in the minds of students, they can not be assumed to be identical with the phylogeny of mankind through association. To speak of "polished pottery people," "Folsom people" or even—I almost hesitate to write it—"Bell Beaker people" on the basis of the presence in archaeological sites of a single distinctive artifact type is an epistemological solecism which

can and has warped our studies. Tallgren⁵⁰ considers this one of the major weaknesses in archaeological procedure. He describes it as ". . . the tendency to see . . . a uniform population or ethnic group behind cultural phenomena, that is behind the forms of material culture; we have also been too apt to see, in cultural connections and particularly in cultural transmissions, the movements and migrations of *peoples* instead rather of the products of different social classes and of commerce." A good example of this tendency can be found in the American field. Because of the great amount of red ochre found with caches of certain distinctive artifacts in Maine, the complex constructed on the basis of these artifacts was called the "Red Paint Culture."⁵¹ In usage, many archaeologists as far west as the Mississippi Valley speculate upon the presence of the "Red Paint people" whenever red ochre appears in a site or a burial. Yet red ochre was generally used by most North American Indians. This, again, is not a criticism of the application of the term to the arbitrary complex, though a better one certainly could have been devised, but it is a criticism of the use of the term in a large measure out of context and in such a way as to suggest migrations and associations of physical type not justified by the evidence.

Before proceeding further with discussion of the use of this concept by archaeologists, it may be profitable to examine briefly the history of the application of biological classificatory schemes to Southwestern archaeology.

With the development of stratigraphic technique in the second decade of the twentieth century, the accumulating mass of data from excavations and surveys, still for the most part disjointed, presented a complicated picture which defied the ordinary descriptive approach current until then. The preliminary Kidder-Guernsey and Morris classifications were designed to bring order into this mass and eventually resulted in the Pecos System as described above. A definitely evolutionary concept provided the skeleton for the system, but it lacked sufficient precision to satisfy men familiar with more exacting disciplines. In an attempt to supply this precision a binomial taxonomic sys-

⁴⁹ Rouse, 1939.

⁵⁰ Tallgren, 1937.

⁵¹ Rowe, 1940.

tem for the classification of pottery was invented and, based primarily upon it, there developed a "family-tree" concept of culture classification designed to describe all Southwestern prehistory.⁵²

Colton⁵³ outlines the development of this system in Hargrave's original presentation of the taxonomic studies of the Museum of Northern Arizona. "The present situation of pottery nomenclature and classification resembles biology before the days of Linnaeus. In this paper the general rules of biological nomenclature have been followed and a biological classification adopted. . . . At a conference at Gila Pueblo, April 1930, several Southwestern Workers tentatively agreed to adopt a biological method in the classification of Southwestern pottery types."

Present at this conference were Mera, Colton, Hargrave, Renaud, and Gladwin.⁵⁴ From this system of pottery classification came Gladwin's phase system, even more strictly biological, if possible, in that it emphasized the evolutionary nature of the scheme in graphical representations of "lineage," "family-trees" of culture.⁵⁵

The biological background is further emphasized by Hargrave in his taxonomic outline which included the following groups: Kingdom, Phylum, Class, Order, Ware, Genus, Type, or Subtype. The genetic basis was confirmed by the introduction of hybrid genera and types.⁵⁶ The continued use of the term "hybrid" in connection with artifacts by many Southwestern taxonomists seems to me to be one of the best reasons for a thorough examination of our concepts of cultural processes.

That these ideas are still current, despite disavowals, can be shown by a quotation from the latest taxonomic manual of Southwestern pottery.⁵⁷ "A Series, therefore, is a group of pottery types within a single ware in which each type bears a *genetic relation* to each other, including all those types and only those types that occur . . . in the *direct line of chronological genetic development* from an original primitive or *ancestral* type to a late

type." The italics are mine; in the original the entire passage is in italics.

An accompanying statement that pottery objects are inanimate does not remove the definite phylogenetic implications of the above quotation. I believe it is impossible to think in those terms without implying race history concepts of physical causal relationships.

That I am not waving a "red herring" in emphasizing this point is perhaps best shown by the following quotation. In an article entitled "The Family Tree of Chaco Canyon Masonry," F. M. Hawley says: "Southwestern Pueblo pottery of the prehistoric periods has been studied, named with dozens of geographic appellations, and traced back from period to period with *genealogic* thoroughness. 'And La Plata Black-on-White *begat* Red Mesa Black-on-White, and Red Mesa Black-on-White *begat* Escavada Black-on-White, and Escavada Black-on-White *begat* Gallup Black-on-White.' But the *family tree* of prehistoric Southwestern walls has not been cultivated with the ardor of the potsherd horticulturalist; the relation of roots to branches has been largely conjectural."⁵⁸ This was apparently written in all seriousness. The italics are mine.

Most of the men closely associated with this development had received a major part if not all of their scientific training in the biological sciences. Colton was a well-known biological systematist at the University of Pennsylvania; Hargrave, his assistant, was a competent ornithologist; and Mera holds a medical degree. Their energetic application of their own specialized knowledge to archaeology is extremely commendable and follows the best archaeological tradition of adapting whatever may prove useful in the techniques developed in other fields of learning. In this category are geochronology, dendrochronology, pollen analysis, soil analysis, etc. In the case of artifacts and cultures, however, there is an important difference, and it seems to me that this difference *must* be considered; namely, although applied to archaeological problems, glacial geology still deals with geological phenomena,

in such systems is given on pp. 41-42, herein.

⁵² Gladwin, 1934.

⁵³ Hargrave, 1932, p. 7.

⁵⁴ Gladwin, 1930.

⁵⁵ Gladwin, 1934. An example of one of the dangers

⁵⁶ Hargrave, 1932.

⁵⁷ Colton and Hargrave, 1937, p. 3.

⁵⁸ Hawley, 1938.

dendrochronology still deals with the growth mechanism of trees, pollen analysis still deals with plant remains, etc. That is, the materials which these techniques analyze are still the materials they were designed to handle before they were adapted to archaeological ends. The question we must ask is simply: Is this the case with biological classifications applied to artifacts and culture complexes? The answer, it seems to me, is a negative. The systematics of biology was designed to classify living organisms. Even though we disregard the doubts presented above of the value of the technique in biology itself, we still are faced with the fact that, with the exception of skeletal material, the objects and concepts of archaeology are not living organisms or parts of living organisms. Consequently, their development is not properly represented by a classificatory technique based upon the genetic relationships of living organisms.⁵⁹

In the foregoing pages I have attempted to show, principally, 2 things: (1) that all classification is arbitrary, that the classes are made by students for their own use; and (2) that the biological implications inherent in certain archaeological systems of taxonomy are dangerous in that they may introduce concepts at variance with the anthropological and historical processes with which we are dealing.

The question before us now is, what can we do? How should we proceed in the analysis of our data? I repeat that we must have conceptual schemes. We can do nothing without them, because we can not think without them. We need them to help make accessible and comprehensible a mass of otherwise disorganized material. The statement, often made at present by those who are dissatisfied with taxonomy, that we must abandon classificatory methods and substitute a "purely historical" scheme based upon tree-ring chronology means not what it at first appears to mean but only that one conceptual scheme is suggested in place of another. The "historical" method of classifying cultures by centuries or by dynasties is just as much an arbitrary scheme as is

the McKern System of archaeological taxonomy.

The way in which we handle our material must, first of all, be related to certain basic concepts of the nature of this material. Duncan Strong, in his essay on anthropological theory and archaeological fact conceives anthropology as "midway between" the biological and social sciences,⁶⁰ in that it deals with 2 "definitely historical" processes: (1) biological evolution and (2) cultural development. The former has to do with the animal nature of man and is physical anthropology. The latter has to do with the products of the minds, hands, and nerves of men and includes archaeology.

Here, then, is a basic scheme, which seems as good as any to serve as a point of departure for archaeological research. It assumes that we deal with a succession of human deeds and relationships. In archaeology we study the material manifestations of these deeds and relationships and attempt to reconstruct the latter. If we can then go beyond the historical task and interpret our material so that it can make contributions to the specialized divisions of modern life, so much the better for our justification before the world at large.

This reconstruction can not, it seems to me, be done solely on the basis of schemes for the classification of artifacts, or of groups of artifacts placed together in "periods," "complexes," "phases," etc.

With regard to this, Tallgren⁶¹ in his paper on the method of prehistoric archaeology says: "Brilliant systematization, regarded as exact, has not led and does not lead to an elucidation of the organic structure of the whole life of the period studied, to an understanding of social systems, of economic and social history, to the history of religious ideas. In short, forms and types, that is, products, have been regarded as more real and alive than the society which created them and whose needs determined these manifestations."

However, it should be noted here that systematization when not regarded as exact is not only useful but also necessary in the handling

raphy, the laws of the natural sciences are far too rigid to provide an adequate interpretation of human culture. . . ." Movius, 1942, p. xxii.

⁵⁹ Strong, 1936.

⁶¹ Tallgren, 1937.

⁶⁰ Archaeologists of the Old World, notably Childe and Tallgren, also warn against the noncritical application of the systems of other disciplines to our problems. In "The Irish Stone Age," H. L. Movius writes, "But with the exception of the primary rule of stratig-

of our multitudinous evidence. When the various systematizations are regarded simply as bits of evidence themselves, though of a different kind from the actual objects, and when they too are submitted to analysis, they then serve as profitable tools. In much current work I seem to see the misconception that systematic arrangement, that is, classification, is in itself analysis.

At present for the final summing up at the end of a study I see no alternative to the so-called "narrative approach" which, currently, is sometimes decried. The kind of simplification and systematization introduced by the usual classificatory schemes brings about a distortion which must be corrected by proper interpretation, and proper interpretation of such things demands narrative, not charts and diagrams, which are simplifications themselves. Improper interpretation and lack of understanding of these simplifications has definitely hampered advancement of our studies in many instances.

As an example of this distortion I shall cite the reasoning used by Gladwin in dating the "Vahki Phase" of the Hohokam culture at 300 B.C. I hasten to assert that I do not say that the objects classified as Vahki are not that old. I am perfectly willing to admit that I think it unlikely, but that is beside the point; our interest here is the argument by which Gladwin attempts to establish the date.

During the study of the material excavated at Snaketown a scheme of phases was set up based upon typological variations in pottery, house form, and other artifacts. The later phases in this sequence were cross-dated by means of intrusive potsherds with certain periods in the Pecos Classification of Pueblo cultures. The uncertainty in the minds of students over the number of years which should be assigned to the Pueblo periods is well known. However, for the sake of convenience it has become customary for many workers to consider a "period" roughly and loosely to represent 200 years. Gladwin, then, accepts this time unit for a Pueblo period, asserts that Hohokam phases are equivalent to Pueblo periods, and concludes as follows: "By using these methods at Snaketown, we have been

able to define seven phases, the last of which ended about 1100 A.D. Since each of the two latest phases lasted two hundred years, we may assume that the occupation of Snaketown, from first to last, was fourteen hundred years, which would place the beginning of the Vahki Phase at 300 B.C."⁶² As pointed out on page viii, the Vahki date was revised by Gladwin shortly after the first part of this paragraph was originally written in 1941.⁶³ My statement is left as written because, although the new date for the Vahki Phase, 600-650 A.D., is considered by many to be a more reasonable date for that phase, Gladwin has arrived at it by exactly the same method. He has merely changed the time value of a phase from 200 years to 50 years.

As with all his theories, Gladwin quite properly states it as an assumption and allows that it may be questioned. At the same time he submits that the assumption is not arbitrary, a proposition with which I can not agree. What he has done is to correlate one set of arbitrary phases, defined by himself, in the Gila Basin, with another set of arbitrary phases, defined by the Pecos Conference and called Periods, on the Colorado Plateau. He then assumes that his phases represent a constant rate of culture change, that, if the last two represent the span of 200 years, all other phases existed over the same length of time. Yet there is more variation in house type assigned to the Pueblo I period alone than in the whole range of the Snaketown phases. The differences in diagnostic pottery types are also relatively smaller between most of the Snaketown phases than they are between Pueblo periods. Most workers in the Pueblo area would consider many of his phases to be merely minor variations within periods, which is just another way of saying that another student might, quite legitimately, make different phase divisions, with correspondingly different results in dating by this method. It might also be pointed out here that a much different result as to date would be obtained if the original Hohokam "periods" (Pioneer, Colonial, Sedentary, Classic, etc.) should be used in the correlation instead of the later Hohokam phases.

Gladwin's assumption that his "phases" can

⁶² Gladwin, 1937, p. 9 *et seq.*

⁶³ Gladwin, 1942.

be considered all to be equivalent to 200 years in the time-scale, in the argument given above, can even be questioned on the basis of his own published work. In Gladwin, 1934, he adapts the Pueblo cultures to his phase system, assigning phases throughout the Pueblo area. In the charts published in that paper he presents 62 phases in columns adjacent to the listing of Pueblo periods. However, only 16 of those 62 are equated with Pueblo periods and therefore equivalent to 200 years, in terms of his Hohokam argument. But there are 9 instances where 2 phases are equivalent to 1 period, that is, following the same reasoning, 18 phases are only 100 years long. Similarly, 18 more come at the rate of 3 to a period, or 67 years per phase; 8 more are at the rate of 4 to a period, or 50 years per phase; and 2 phases are listed as equivalent to 2 Pueblo periods each, or 400 years per phase. Thus only 25.8% of these phases are equal to Gladwin's 200 years to a phase, according to his own system of reckoning. An even smaller number, only 12.9%, equal 50 years, which is the new time value of a phase assigned in Gladwin, 1942, the Snake-town revision. And this, indeed, is what we should expect. Except for one special case, phases, by reason of what they are and how they are made, are not and can not be equivalent in time-span. The exception is in classifications like the one we often use for our modern European cultures, dividing them by centuries, with chronology as the sole determinant of period or phase. Some students are now trying to use the period names of the Pecos Classification this way, in conjunction with tree-ring dates. We can have no quarrel with this, if the dates are well established and if the original period diagnostics of the Pecos Classification are completely abandoned.⁶⁴

I have taken my example from Gladwin's work, above, merely because of the present importance of the Snaketown dating. We have all had similar trouble and have made similar mistakes. I believe that a better understanding of the nature of classificatory systems will save us from this kind of fallacy in reasoning. We

have here an illustration of one of the things which such schemes do to us, against which we must ever be on guard. The *force of the scheme* itself produces a new type of archaeological conservatism, the conservatism of false reality which, after all, is nothing but dogma dressed up in modern terminology. These schemes often lead us into what A. N. Whitehead calls the fallacy of misplaced concreteness.

The above discussion brings us to the most important taxonomic question in Southwestern archaeology. We have already decided that major conceptual schemes are not only necessary but unavoidable, and that minor classificatory schemes are also useful if properly used and understood. The greatest difficulties with them in practice have to do with the criteria or diagnostics by which the various divisions are set up.

Outstanding here is the vexing question of where to place a trait, a group of traits, a site, or part of a site. As has already been shown, the things, unfortunately, do not "fall into" categories by themselves, but must be put in them. The taxonomic rules by which the placing can be done are far from clear.

Three questions posed by Kluckhohn⁶⁵ will serve to introduce these problems. He asks:

- 1) "Is it absolute presence or absence of the criteria which count or merely predominance — or does the answer to this question vary in the case of various traits?"
- 2) "Must the culture or 'culture period' check with all or with how large a majority of the diagnostics?"
- 3) "Are certain of the criteria indispensable and others not?"

To point the question he cites a hypothetical problem. Suppose there are 8 criteria generally accepted for Pueblo I and we agree that 6 of them must check before the period designation may be applied. Then "will we still call a site Pueblo I if 6 of the 8 criteria are found indubitably associated with a masonry type or a pottery complex which has been accepted as diagnostic of Pueblo II?" The answer to this, in

tury" system in the Southwest, where successfully applied it will only serve as a convenient time-scale. Classifications based on other cultural factors will still be necessary.

⁶⁵ Kluckhohn, Reiter, *et al.*, 1939.

⁶⁴ However, in this case, since Pecos period diagnostics loom so large in our thinking, and since tree-ring dates are now for the most part expressed in terms of our calendar, it might be better to apply the "cen-

terms of contemporary usage, is usually no. This problem presents the question of the weighting of criteria and, as all Southwestern classification systems are used at present, despite statements of cultural inclusiveness, pottery type, primarily, and house type, secondarily, are the most significant factors. The only important exceptions to this are 2: (1) the few workers who continue to use the extremely unsatisfactory criterion of physical type⁶⁶ as the most important diagnostic and (2) those who attempt to use tree-ring chronology alone.

This situation is recognized by Kluckhohn who discusses it with particular insight into the problems of systematics.⁶⁷ His statements are worth quoting at considerable length, as he has gone further into the problem than any other writer in the Southwestern field. With regard to the weighting of criteria he says:

"Observation of the actual operations of archaeologists suggests that in many cases the classification of a site is actually made on the basis of pottery complex or architectural style (including masonry type) alone. If this fact is explicitly stated, this procedure may well be the most convenient and quite unobjectionable. If, however, there is assertion or implication that the classification has been made on the basis of total culture complex, some confusion results." Here again we are faced with the difference between statement and practice, so characteristic of archaeological systematics.

Kluckhohn goes on to say:

"For what occurs is that the other culture elements found associated with the critical pottery complex or architectural style are simply dragged in after the crucial step has been taken. If we are really operating with pottery or masonry-architectural complexes (or a combination of these two) only, it would be in the interests of clear thinking if this circumstance were brought into the open, either through terminology or explicit statement. It seems possible that classificatory operations frankly based solely upon these apparently somewhat more sensitive and more consistent criteria would be most useful. The associated culture elements (not used in cultural classification)

could then be studied apart from the prejudice of a question-begging nomenclature. . . .

"It would, then, be necessary to make clear how great a proportion of traits otherwise regarded as diagnostic of, let us say, Pueblo II could be admitted *seriatim* in a Pueblo I site. It would likewise be imperative to state if any criteria are to be weighted as of greater importance and which differentiae are to be applied first. Because, as in physical anthropology, two investigators can use the same diagnostic traits in making a classification and yet get different results, depending on the order in which they are applied (with resultant eliminations). It follows, also, that the relative significance to be attached to positive and negative evidence would have to be specified."

Such analysis of our current practice is certainly necessary at present. Kidder and Guernsey worked much with sandal types, Haury and F. H. Douglas have made detailed studies of textiles, Bartlett has written a paper on metate types, R. B. Woodbury is studying stone and bone implements, respectively, but very little indeed is known about the chronological and geographical distributions of artifact types in the Southwest aside from pottery and, to a much smaller extent, architecture. Surely it is better procedure to recognize this and to govern ourselves accordingly than to cover our systems with a camouflage of completeness, admittedly a desirable ideal, but one which is far from attained. The very admission not only eliminates current misconceptions but emphasizes the urgent necessity of intensive study of the lesser-known divisions of material culture.

There is another factor here which may help us to a better understanding of our difficulties with criteria. In order to give a heterogeneous mass of data orderly classification, it is necessary arbitrarily to set up definitions of groups and to determine certain characteristics which will be considered as diagnostics for these groups. But after this is done it seems always to be the case that a number of objects can not be satisfactorily placed. And the more material and the more knowledge the investigator gathers, the greater this difficulty seems to become.

⁶⁶ See pp. 67-73.

⁶⁷ Kluckhohn, 1939b.

The difficulty applies to detailed classifications of artifacts and to the broader concepts of culture classification as well. In the former case the so-called "intermediate types" cause the trouble. And the glib answer, "Make a new type," does not solve the problem, because, as in the case of Jeddito Black-on-orange and Jeddito Black-on-yellow pottery in the Hopi country, when a large number of specimens is obtained, a complete series marked by almost imperceptible gradations appears between the 2 types.

In the latter case, that of the broader concepts of culture classification, the difficulty is that when a large number of sites have been excavated, it is found that the criteria do not change simultaneously, like the change of billing for a vaudeville show, but tend to change individually and to present a varied picture of lag and overlap in individual traits. In my own experience I have never seen a Southwestern site which did not present, in a single "occupation-level," criteria of at least 2 major cultural periods. The only unnatural thing about the hypothetical problem presented by Kluckhohn above was the small number of overlapping criteria.

It is this situation, shown admirably by trait charts in Rouse's first report⁶⁸ and present in the reports of all major Southwestern digs, which impels Kidder to look upon all arbitrary classifications as temporary and to say: "... our investigation has now reached a point at which formal classifications, such as the Pecos nomenclature, are not only of lessening value, but are often . . . positively misleading."⁶⁹

In biology, taxonomy has also encountered this difficulty. Robson,⁷⁰ discussing the species problem, says: "The only conclusion at which we can arrive is that there is no criterion by which we can define and delimit separate units of the status required by the species-concept. There may be a general sense in which the four criteria we have discussed are simultaneously applicable. But the degree to which in any one instance differentiation is manifested in respect of these is so variable that it defies organization in the sense required by the concept. It is not only impossible to find a standardized

type of group by applying any single criterion; but also the various main criteria do not give the same results, the same indications of affinity."

On the cultural side consider a wealthy modern Hopi trader in his house which has windows purchased in Holbrook, Arizona, but a roof similar to that of a prehistoric dwelling. Imagine him seated on a stone loom weight, facing a coal range of the vintage of 1890, smoking a "tailor-made" cigarette, wearing triangular turquoise earrings, and listening to a dance orchestra from Havana, Cuba, on the short wave band of a new radio, while his son drives up in a 10-year-old Ford and his wife grinds corn in a primitive mealing bin, using, for sentiment's sake, a mano which she has picked up at the old Sikyatki ruin. This is an extreme case, but such cases can be demonstrated any day in the year. In some degree or other, it is situations like this we are called upon as archaeologists to handle. But, at the outset of any given problem we do not have in hand the information which enables us to evaluate the archaeological case as we can the modern case just cited. So, we make our schemes, and, if we are wise, as our knowledge of that particular set of problems advances, *we change our schemes.*

The overlaps are not necessarily, as some would have us believe, unimportant and of only a few years duration. Some of them last for centuries. The "intermediate types" are *not* unimportant, to be eliminated, as is often done, by disregarding them. We are dealing with a constant stream of cultural development, not evolutionary in the genetic sense, but still a continuum of human activity.

It is quite apparent, now, that we are facing a much larger question than the one so frequently asked, "Should the Pecos Classification be abandoned?" My answer to that question perhaps points the way to the general suggestions as to procedure with which this section will be concluded. I do not believe that the Pecos Classification should be abandoned. I do, however, believe that we should abandon the practice of treating it as the only classification applicable or useful to the phenomena we group under the term Pueblo or Anasazi cul-

⁶⁸ Rouse, 1939. ⁶⁹ Kidder, 1936, p. xviii, footnote 2.

⁷⁰ Robson, 1928.

ture. My contention is that it is very useful in certain stages of our studies. In many parts of the region and in many aspects of our investigations its definitions and terminology provide an extremely handy mechanism. On the other hand, in certain districts and in certain divisions of the development of material culture our accumulated knowledge now renders that sort of classification unnecessary. In his consideration of the situation in Chaco Canyon, Kluckhohn says:⁷¹

"But we must remember, as Whitehead has so often reminded us, that a classification is, at best, 'a half-way house.' A classification is useful so long as the facts fall without violence into it. So soon, however, as their greater bulk, greater complexity, or greater subtleties of discrimination make the classification a Procrustean bed into which the maimed and helpless facts are forced, the classification should be abandoned or radically modified." This process is going on all the time, in actuality. The Museum of Northern Arizona, the University of New Mexico, the University of Arizona, the Laboratory of Anthropology at Santa Fe, and the Field Museum all use the Pecos Classification in conjunction with concepts borrowed from Gladwin's system and concepts of cultural development by centuries based upon tree-ring chronology. Yet many of the workers in the field express dissatisfaction with the lack of precision involved in such procedure and continue to feel that they should adopt a single system and "stick to it." My contention is that to adapt and change classifications and to make new ones as needs arise is correct procedure provided it is implemented with a better understanding of the nature of systematics, a more critical examination of new systems for dangerous distortions (like the "family-tree" concept in the Gladwin System), and accompanied in the published reports by *a statement of the various assumptions used*. To adopt a single system and to stick to it would be fatal to scientific progress.

In certain minds approval of such technique will be denied because it is not precise. Admittedly, it is not. And for that very reason it is practical and scientific. We are not able to treat precisely the material with which we

are dealing. Whether or not we shall in part ever be able to do so in future can not be decided now. The fact is that the processes which govern the deeds and beliefs of any group of people at any particular time are conditioned by a large number of variables, many of which we do not understand and many of which we as archaeologists are not able to deduce from our fragmentary evidence. A flexible, nonprecise technique is more useful and more "scientific" for the kind of evidence we have of the kind of phenomena with which we deal than is the pseudo-precision which, at this time, is the only alternative.

We must make our choice between these 2 alternatives. Shall we maintain a fluid technique which can be changed as our needs change and as our knowledge develops or shall we fix our technique into a pseudo-precise system which by its very dogmatism will bar all progress beyond its level? Fortunately, we probably can not do the latter, even should we wish it. The vigorous spirit of inquiry in the mind of man certainly will not be satisfied with it for long. But why waste our time trying it on?

Thus we come to what may be a positive rule of procedure. All classificatory schemes, it seems, are arbitrary and designed to fill an immediate need. If research prospers, there comes a time, and this is what Kidder says in the quotation above, when the information gathered goes beyond the simplifications of the given systems. *The systems then become obsolete*, to use them longer is awkward and definitely warps the results. We should then pass on to new systems which will absorb all the known "facts" and systematize the new and more "advanced" unassimilated data.

Our systematics, then, must be flexible, too, as are the materials with which we deal. In all of this we must remember, as Tallgren points out,⁷² that it is the *use* and not the *form* of artifacts which is important to us. Variations in form, treated systematically, can aid us greatly in prosecuting our research, but when we can fit the object into its economic or social environment, into the system of production of which it is an instrument or the ceremonial system of which it is a part, we should readily

⁷¹ Kluckhohn, Reiter, *et al.*, 1939.

⁷² Tallgren, 1937, p. 158.

dispense with the purely morphological classification.

That is going a long way, probably further than most of us will ever get in our lifetimes, but all our work should tend toward such an end. Similarly with "cultures"; when we can show, as I think we can in this report, the gradual development of houses, kivas, pottery, and a few other objects by numerous small changes over a period of 600 or more years, it will not advance our cause to present them in only 4 periods, which we must do if we discuss them only in the terms of the Pecos Classification.

What, then, should our procedure be? It is easy to offer destructive criticism and fashionable to leave it at that. And I am not one of those who feel that we are not entitled to indulge in destructive criticism unless we also offer constructive suggestions. But in this case I shall offer suggestions which I hope will prove to be constructive. I do this because I believe the subject of our analytical method to be of supreme importance to us and because I believe I can see some ways in which our methods can be improved and in which some current difficulties can be avoided. On the other hand, most of the suggestions I am about to make are so simple that I distrust them somewhat myself. I present them for consideration, if they seem worthy of that, and above all with the hope that this discussion will induce some further examination into the basic assumptions and analytical methods of our subject.

With regard to taxonomy, then, I believe we can say this. As archaeologists we must classify our material in all ways that will produce for us useful information. I repeat, we need more rather than fewer classifications, different classifications, always new classifications, to meet new needs. We must not be satisfied with a single classification of a group of artifacts or of a cultural development, for that way lies dogma and defeat. We are, or should be, in search of all of the evidence our material holds. Even in simple things no single analysis will bring out all that evidence.

We must continually analyze not only our material but also our methods, we must continually check our concepts for distorting factors, and we must always remember to advise

the reader thoroughly of the concepts we are using.

We need have no fear of changing established systems or of designing new ones, for it is only by such means that we can progress. At the same time we must not present our new system or systems as a standard to be used and adopted by everyone and forevermore. We must recognize that any given system in its entirety will probably be applicable only to the given set of problems it was designed to meet. The main value of a published description of a given system is that it may then be *adapted* by another student to his problems, not that he should force his material into it.

Above all, we must remember that we are dealing with a cultural continuum which is *continually changing*. Even the products of the automotive assembly line are not identical, and this is probably the greatest material standardization yet achieved by mankind. We must ever be on guard against that peculiar paradox of anthropology which permits men to "trace" a "complex" of, let us say, physical type, pottery type, and religion over 10,000 miles of terrain and down through 10,000 years of history while in the same breath, or in the next lecture, the same men vigorously defend the theory of continuous change.

Before concluding this chapter, in which I have so greatly emphasized the subject of taxonomy, it will be well to dig even deeper than we have dug already and to consider the ultimate objectives of archaeology. For the devices discussed above certainly do not constitute the end of our studies. They are merely a part of the tool kit we must use in achieving that end, whatever it may be.

Although to add to our store of accumulated knowledge may be in itself satisfactory to many, I believe that our objective should be much more than the systematic amassing of information and the conjectural reconstruction of past events. Beyond that, as I see it, the aim of archaeology is to relate our newly gathered information scientifically to the immediate problems of human life and society, through an analysis of the problems and achievements of other peoples, toward a better relationship with our physical and social environments. We must broaden our cultural horizon by showing to ourselves the accomplishments of these

others in the various fields of human endeavor, both material and artistic.

There are those who will object to the inclusion of the aesthetic aspects of prehistoric cultures along with the material on the grounds that, while the latter is objective, the former is purely subjective and can not be brought to life from the past. It will be said that I am injecting the personal equation, something no good scientist should ever do. It may even be said with vehemence, as though I could keep the personal factor out if I wished to do so. In this chapter I have deplored dogmatic statement but I shall now offer one for my critics to work on. *Those who say these things will be wrong.* As I have pointed out time and again in the preceding pages, the personal element is necessarily implicit even in the most mathematical systematics. To present our results so that they will be useful to men at large we must, at times, leave our systematics with

our test tubes in the laboratory. If we fail to do so, every once in a while, we shall fall short of our aim.

Such presentation, which I believe to be necessary, involves the "narrative approach" and subjective picturization. This must be done with any body of archaeological data, if those data are to be of use to anyone besides archaeologists. Our obligation to society, our aim which I defined 2 paragraphs above, has been stated much more simply by a friend of mine, a lawyer — "A reasonable degree of humanizing is the only justification for archaeological research, carefully stopping short, of course, of fanciful romance." That statement contains a challenge we must meet. We are on the defensive. Our research is costly and its products must be useful. To make them so we must vastly improve our systematics and then go beyond them. We must present much more than our systematics to society.

THE "PUEBLO INVASION"

In these days every landmark is like Alice's flamingo-croquet-mallet, when you refer to it, the creature curls up into an interrogation mark and looks into your face; and every corner-stone resembles her hedgehog-croquet-ball, which, just before you can use it, gets up and walks away. — GALSWORTHY

AT THIS point it is desirable for us to examine thoroughly the assumed "Pueblo invasion" which was supposed to have brought about the change from Basket Maker to Pueblo "cultures" between Basket Maker III and Pueblo I in the original Pecos Classification. In order to do so I must, perforce, repeat briefly certain statements found more fully elsewhere in the report. The Peabody Museum excavations on Alkali Ridge have added further information for the reconstruction of Basket Maker-Pueblo history. The picture about to be presented may be described as a cultural continuum, the gradual development and expansion of major cultural traits. Changes, improvements, and recombinations of traits occurred throughout, but at no one time, in my opinion, does the cultural evidence indicate a mass invasion or, as has also been suggested, peaceful mass penetration of a large alien population with a strikingly different culture. Many of the traits originally supposed to have been contributed by the "newcomers," such as permanent habitations and the bow and arrow, have for years been listed as characteristic of Basket Maker III. The changes in traits as shown in the archaeological records seem to be individual and gradual rather than associated and abrupt.

Furthermore, even if the statements in the above paragraph are not true, we still have not found an archaeological culture outside the Pueblo area exhibiting the diagnostic traits of the postulated invaders. The "Mogollon" does not provide this. Firstly, it is well within the Pueblo area. Secondly, in many traits, as revealed by the excavations of Nesbitt, Haury, and Martin, it is identical with Basket Maker III and Pueblo I. Those students who feel that the Mogollon should be classified as a different "culture" are still attempting to find enough distinctive traits to justify this to others. The

same general processes of culture change seem to take place in the Mogollon area, with a few variations, as occur in other parts of the Pueblo region; a statement which can as well be made for the Mesa Verde, the Chaco, Flagstaff, or any division where sufficient investigation has been done to reveal basic similarities and local variations.

The "X-culture" put forward by Flora¹ as representing the "coming of the Pueblos" seems to be little more than the discovery that the classic Pueblo type of arrow-point may be earlier in the vicinity of Durango than elsewhere.

The Hohokam, in the Gila Basin, is quite different from Pueblo I, and the new Patayan culture designed by Colton similarly does not seem to fill the bill.

Consequently, the most reasonable reconstruction into which all of the cultural evidence available at this time seems to fit appears to me to be as follows. In each district of the Pueblo area we start with the earliest farming culture found. This is usually in the Basket Maker II or Basket Maker III stage according to the Pecos Classification. Certain cultural variations between districts have been noted in the earliest remains. Study of later sites in each district shows these cultures following a basically similar development with variations continuing, some of the old variations dropping out, and others coming in. The new variations in the later period appear to me to represent 4 processes: (1) diffusion of old variations between the districts; (2) new local inventions or modifications; (3) persistence of former differentials in local fashions; (4) introductions from the outside, either by means of cultural diffusion or by intermittent immigration. These processes continued down to the coming of the Spaniards who found the sixteenth-century Pueblos, which we classify as a

¹ Flora, 1940b.

single cultural group, presenting, nevertheless, considerable variation in the details of individual traits in all branches; material culture, social organization, religion, and linguistics.

The relationship of the 4 processes listed above to the movement of peoples is our immediate concern. The cultural evidence seems to me to indicate 2 kinds of movement going on intermittently throughout the centuries of which we have record. 1) Movements of individuals, families, and larger groups from one part of the Pueblo area to another. 2) Immigration of individuals, families, and small groups from the outside. The former assisted in the diffusion of local cultural variations within the area; the latter brought traits in from the outside. The amount of movement must have varied from time to time.

I can not, however, make the cultural evidence fit the postulation of a mass migration into the area of people bearing a culture definable in terms of the differences between Basket Maker and Pueblo in the Pecos Classification.

In the course of fifteen years' work upon this problem I have had many discussions with other students in the field. I have found much agreement with this general thesis, and recent publications have tended more and more to reflect a growing belief in a basic cultural continuum. Perhaps the outstanding example of this is the adoption of the term "Anasazi"² which joins the prehistoric Basket Makers and Pueblos in a single cultural group.

On the other hand, the theory of the "Pueblo invasion" persists despite the cultural evidence. The reason for the persistence is a continued belief in the change in physical type which is supposed to have occurred in the seventh and eighth centuries A.D. In terms of physical anthropology, the Basket Makers have been presented as dolichocephalic (long-headed) and the Pueblos as brachycephalic (round-headed).

Early in this study, when it became apparent to me that the cultural evidence was not fitting very well with the invasion theory, I began an investigation of the data upon which the statements of a change in physical type were based. My suspicions were immediately aroused by a

number of things. In the first place, most of the skulls found in graves classified as Pueblo I, II, and III were greatly deformed. The deformation was an occipital or lambdoidal flattening which shortened them considerably. A correction had been devised, however, to compensate for the deformation in the computation of the cephalic index. The correction was based upon a measurement, basion-nasion length,³ supposedly unaffected by the deformation. On skulls from Alkali Ridge exhibiting a high degree of deformation, however, this measurement was obviously affected, and grave doubts arose in my mind of its reliability in milder cases.

The second troublesome discovery was that many of the statements made by otherwise competent archaeologists about the head form in their excavations were not based upon measurements by trained physical anthropologists but, rather, upon their own observations, often without measurement, and sometimes even upon fragmentary skulls.

The final contribution to my suspicions was the discovery that, in the very few studies of Southwestern skeletons published by physical anthropologists, "Basket Makers" were by no means all dolichocephalic nor were undeformed "Pueblos" all brachycephalic.

At this same time, in the early 1930's, 2 physical anthropologists were beginning to devote their energies to this problem: Carl Seltzer, making field studies of modern Pueblos, particularly Zunis and Hopis, and George Woodbury, working with archaeological material. Seltzer compared his modern measurements and indices with as many groups of archaeological skeletons as he could find adequately described. Woodbury measured almost all recorded skeletons from Basket Maker II, Basket Maker III, and Pueblo I sites, 15 series in all, including much of the peripheral material associated with cultures resembling those classed as "true Basket Maker." Neither of these studies has been published, but both men have kindly given me permission to quote from their manuscripts.⁴ Significant results will be presented as briefly as possible, with occasional direct quotations.

² See pp. ix-x, for comments on the term "Anasazi."

³ Shapiro, 1928, p. 18.

⁴ Since this was written one of these reports has been published, see Seltzer, 1944.

Woodbury considered 53 characteristics of the skulls, 38 measurements, 14 indices, and the cranial module, comparing every series with each of the 14 others. His findings⁵ will prove startling to all except those who have been prepared by their own interpretations of the cultural evidence.

Briefly, he found according to his method of comparison that:

1) The San Juan Basket Maker II series from Utah and Arizona is more closely related to the Morris Pueblo I series from southwestern Colorado than it is to the Red Rock, Kayenta, and La Plata Basket Maker III, or to Big Bend and Guadalupe Mountain Basket Maker, or to the Coahuila Cave material. (I use his names for the various series.) That is, the San Juan Basket Maker series is more closely related to a Pueblo I series than it is to any other Basket Maker series.

Not all of the series called Basket Maker, above, are called Basket Maker by all Southwestern archaeologists. Woodbury, however, quite properly used all series he could get to which that label had been applied, even if disputed.

2) The Red Rock Basket Maker III series from northeastern Arizona is more closely related to both the Morris and Roberts Pueblo I series than it is to the Kayenta and La Plata Basket Maker III, San Juan Basket Maker II, and the Guadalupe Mountain and Big Bend Basket Maker series.

3) The same statement can be made for the La Plata Basket Maker III series as is made for the Red Rock Basket Maker III.

4) The Morris Pueblo I series is more closely related to the Red Rock, La Plata, and Kayenta Basket Maker III, and to the San Juan Basket Maker II series than it is to the Roberts Pueblo I series from Allantown and the Long "H" Ranch Series in Apache County, eastern Arizona.

It must be emphasized that some of the series used are unsatisfactorily small and that the cultural associations are in some cases such that archaeologists might not agree as to the period under which they should be classified. But the important point is that this data is all we have to go on, and such conclusions as can be drawn

must be made from it. In fact, this study by Woodbury is not only the most complete but also the only satisfactorily critical study ever made of skulls with Basket Maker III and Pueblo I cultural associations. To quote Woodbury, he presents "the highest probability as far as the given data allows us to judge. This can always be done whether the data be sufficient or insufficient for other purposes." And I must repeat the distressing fact that all previous conclusions about "Basket Maker" and "Pueblo" physical relationships have been based on very much smaller groups.

I shall quote those sections of Woodbury's conclusions which bear directly on our problem. The italics are my own.

"It has been popularly believed that the earliest southwesterners were 'long heads' and that with the advent of the later Pueblo period, 'broad heads' replaced them. This point of view can at best be described as naive. In the first place there is no great uniformity in head length among the early series and moreover most of them are *medium* rather than long headed. In the next place, the early Pueblos are more inclined to have *medium* than short head length. Finally there is no evidence that there was greater difference between B M III and P I than between B M II and the B M III. If anything the evidence seems to point the opposite way.

"While most of the series are physically unlike they do not clearly show any greater unlikeness at one period than at any other period. Under these circumstances it is impossible to conceive that (during Basket Maker II-Pueblo I times) the Southwest was . . . overrun at any one time by a people of radically different physique. What does seem plausible is that infiltration at an almost uniform rate over a long period of time might have happened. From the discovery that none of the B M III populations, for example, are identical it is easy to see that such an infiltration need not have come from far afield."

In other words, some of the physical variations like some of the cultural variations in a given group may have diffused from another group within the same culture at the same classificatory level. At this point Woodbury also

⁵ Woodbury, MS.

adds the caution that inheritance is not the only factor governing physique.

However, changes did occur. In fact every series differed in some respects from every other one. About the changes he observed Woodbury says: "The physical changes in the populations of the southwest can only be described as fluctuating. There is apparently no tendency. From period to period size and bodily shape seem to contract, enlarge, or change quite aimlessly. There is *no evidence* that, for example, the earliest inhabitants were longer headed and with the passage of time became consistently shorter and shorter headed. As far as these studies have progressed there are only non-directional fluctuations."

Seltzer, working completely independently, from a different approach, arrived at many of the same conclusions.⁶ Surprised at the incidence of long-headedness in the modern inhabitants of Zuni Pueblo, he checked all available published studies of archaeological skeletons. Because of the greater area and time range covered, his results are even more startling than Woodbury's.

Working at Zuni, Seltzer naturally turned first to Hodge's "Old Zuni" series.⁷ These individuals were relatively late in date, from the sixteenth and seventeenth centuries, probably entirely in the early historic period. Seltzer used the 35 undeformed males of this series measured by Hrdlička.

Taking the cephalic index first, Seltzer found the mean for the series to be 75.91, a low mesocephaly very close to dolichocephaly.⁸ The skulls ranged from 68 to 84. 32.35% were dolichocephalic, 52.94% mesocephalic, and only 14.71% brachycephalic.

Pushing his researches back into definitely prehistoric material, Seltzer compared the Hawikuh series with published measurements of the southeastern Utah Basket Maker series, in an attempt to see if he could determine

whether or not the dolichocephaly of the sixteenth century represented the same "racial" strain as that attributed to the Basket Makers. Unlike so many archaeologists he realized that much more than the cephalic index was necessary to produce a significant result and he analyzed a long list of characters.

In his summary, after presenting the measurements and indices in tabular form, Seltzer concludes: "Obviously the two groups have decided resemblances in both dimensions and proportions. . . . The only two statistically significant divergencies to be found for the measurements are in glabello-occipital length and palate breadth. In *all other dimensions*, nasion-prosthion height, orbit height and breadth, nasal height and breadth, basion-nasion length, basion-prosthion length, and the height of the symphysis of the lower jaw, the two groups are *virtually identical*. With respect to the indices, as a result of the longer skull vault of the Basket Makers, we find that the latter series is 2.91 index units more dolichocephalic and 2.27 units more orthocephalic than the Old Zunis. Both these differences are statistically significant. But in regard to *all other proportions*, the two groups again manifest *unusual similarity*. What we have then, are two series, which apart from the fact that one is longer and narrower in the skull vault than the other, are in other respects *almost mirror images of each other*. Although the magnitude of the difference of the vault length is enough to render the two groups statistically distinct, nevertheless, owing to their marked similarity in all other respects, it can be concluded that the Old Zunis are of the true B M physical type!"

Seltzer found this same situation of virtual identity between the Old Zuni series and the selected Pecos "Basket Makers" of E. A. Hooton.⁹ Similarities with Hooton's Arizona Basket Maker series¹⁰ were not so great but

⁶ Seltzer, MS. The section of the manuscript cited here is now published in Peabody Museum Papers, vol. 23, no. 1. Seltzer's conclusions had already been published in brief form in an abstract of a paper delivered at the annual meeting of the American Association of Physical Anthropologists at Yale in 1936 (Seltzer, 1936). Stewart quotes from this abstract in his appendix to Roberts' Whitewater report and presents further evidence in support of Seltzer's conclusions. (Stewart, T. D., 1940.)

⁷ Obtained during the excavation of the Old Zuni pueblo of Hawikuh, see Hodge, 1918.

⁸ The cephalic index is the maximum breadth of the skull expressed as a percentage of the maximum length. The conventional divisions for measurements taken on skeletal material are: indices below 75, dolichocephalic or long headed; 75 to 79.9, mesocephalic or medium; 80 and over, brachycephalic or round headed.

⁹ Hooton, 1930, p. 231.

¹⁰ Hooton, 1930, p. 232.

still striking. The variation in roughly contemporary series, described by Woodbury, is also presented by Seltzer, particularly in the following statement: "It is also evident that the Old Zunis resemble the Utah Basket Makers more closely than the Arizona series, and even more closely than the Utah resemble the Arizona Basket Makers."

At this point in his study Seltzer found it necessary to consider the possibility that the Zuni might represent a sole survival of Basket Maker physical type not to be found in other Pueblo groups. In order to check this he examined 5 groups of skulls, all with definitely Pueblo cultural associations and all classifiable within the Pueblo III and Pueblo IV divisions of the Pecos Classification. These were:

- 1) The Salt River (Salado) series, collected by the Hemenway Expedition in 1887-88.
- 2) Pueblo Bonito-Chaco Canyon series, collected by Judd.
- 3) Petrified Forest series, collected by Hough.
- 4) Chavez Pass series, collected by Fewkes.
- 5) Puye series, collected by Hewitt.

Seltzer also found the correction for deformation faulty and, since all of the skulls in these series were deformed, he was forced to omit the dimensions of the skull vault. In his comparisons he restricted himself, for the sake of accuracy, to diameters and proportions of the facial skeleton and skull base and to expressions of general head size. In cases of extreme deformation some of these even had to be thrown out. The most important results of comparisons of each of the 5 series with the Old Zuni series are listed below.

1) Salt River series, 57 individuals. The only statistically significant differences found were in head size (cranial module and cranial capacity) and in nasal height. "In all the other measurements and the indices the *two groups are consistently alike.*"

2) Bonito-Chaco series, 11 individuals. "What is most remarkable is that so small a series of crania . . . should show identity with the Old Zunis in ten out of twelve measurements and four out of six indices."

3) Petrified Forest group, 13 individuals. Great physical similarity. The only significant difference in measurements was in palate

breadth. There were no significant differences in the indices.

4) Chavez Pass series, 18 individuals. "The average differences between the means is but 0.83 for measurements and only 0.94 for indices. And again we are faced with the conclusion that the Old Zunis and the Chavez Pass crania are essentially of the same physical type."

5) Puye series, 17 individuals. This series was more differentiated than the others in facial measurements, but there were still no significant differences in the indices. The differences in the Puye series are similar to those in the Pecos series, expressed mainly in shorter faces. Seltzer believes this to be a local characteristic of the Rio Grande and the general eastern border of the Pueblo area, relatively late in appearance.

From these comparisons Seltzer concludes that the Old Zuni series was not unique but represented a physical situation widely distributed over the Pueblo area. Comparisons of the 5 Pueblo series above with the Utah Basket Maker series show the same sort of striking similarities. Consequently, Seltzer feels able to state: "Thus, we can safely conclude, after consideration of the results of this comparison, that the several Southwestern (Pueblo) skeletal series as well as the Zunis, have a strong physical bond with the Southeastern Utah Basket Makers, and may have been derived from the same or similarly constituted stock."

On the basis of his work Seltzer sets up a "Southwest Plateau" physical type and draws a number of general conclusions so pertinent to the archaeological problems that I shall quote from them at considerable length.

"Of major importance is the fact that there appears to have been in the upland area a *continuity of 'Southwest Plateau' stock from the Basket Maker period clear up to recent time.* Up to the present, there is no evidence to show that there was any other physical stock *on the same level of importance* as the 'Southwest Plateau' Indians in the make-up of the Basket Maker-Pueblo peoples. The presence of other physical types and deviations from the typical 'Southwest Plateau' pattern among the Pueblos . . . are explainable for the most part as modifications of the original

strain due to the absorption of new blood (in the form of intermittent relatively small contacts). It is also possible that certain of these changes in physical type may be the result of stimuli persistently present in the *environment* or of selective genetic factors. *There is no suggestion of any sweeping change in physical type or of an enormous influx of new blood into the Basket Maker-Pueblo peoples, except during Pueblo IV in the Rio Grande.*"

Then turning to consider specifically the "Pueblo invasion" postulated by archaeologists, Seltzer says: "There is no reason for assuming any radical change in physical type at the end of the Basket Maker period. The . . . sudden appearance of a large number of deformed crania in . . . the very earliest of Pueblo phases, has caused the majority of archaeologists to believe that these deformed specimens marked the arrival of what they termed 'a new race,' a round-headed invasion. The writer can not be of the same opinion. Granted that slight changes in the cranial index were associated with the . . . introduction of occipital flattening and deformation, the lack of concomitant modifications in the other features of the skull prevents our assuming a wholesale arrival of new peoples. Until data are presented showing large alterations in cranial or skeletal features at the time of the introduction of deformation, the writer is prone to believe that the deformed crania are more the expression of a change in (fashion) rather than in physical type."

Part of the difficulty in which we find ourselves arises from the use of isolated physical characteristics as diagnostics of racial type. Several Southwestern archaeologists in recent years, particularly Roberts, have decried this policy. Seltzer, as a competent physical anthropologist, presents a concise criticism of it.

"There is no doubt that on the whole there has been too much emphasis placed on the cranial index in the interpretation of Southwest skeletal material. . . . In respect to the racial problems of the Southwest, general head size, the dimensions and proportions of the nose and face are of at least equal significance with the cranial index. . . . The loose use by anthropologists of such terms as longheads and roundheads, dolichos and brachys, without citing values of the cranial or cephalic indices, is gross carelessness."

In his survey of *published* material Seltzer found that in the southeastern Utah Basket Maker series 30.9% of the males and 50% of the females have cranial indices over 75, with a maximum of 80.8. In the Arizona Basket Maker group 46.7% of the males are over 75 with a maximum of 83.91. And these figures have been available for a long time.

The same situation obtains for the Pueblos. The Hawikuh figures have already been given (p. 70), but it is worth repeating here that 85.29%, or 29 out of 34, all fall below the brachycephalic range, with a mean of 75.91, almost within the dolichocephalic range. In the only other undeformed Pueblo series which is available, Hooton's Pecos Total Series A, the mean is 78.30, in the middle mesocephalic range.

As a final bit of evidence Seltzer quotes figures from Hrdlička's survey of modern Pueblos made in 1900. Groups were measured at 11 Pueblos. Only one, the Hopi group, fell within the brachycephalic range.

In view of these facts we can hardly object to Seltzer's statement: "From this data (which is all there is) there can be no doubt that the Pueblo peoples as represented by these crania were more mesocephalic than brachycephalic. Therefore, to call these people brachycephals is a misinterpretation of the facts."

We have now surveyed the findings of 2 trained physical anthropologists attacking the problem of the racial history of the Pueblo area. Neither of them supports the theory of a "Pueblo invasion" in the latter part of the first millennium A.D. The approaches of the 2 men, Woodbury and Seltzer, were different, their analytical methods were different, and on many points they do not agree between themselves, yet as regards our present discussion they arrived at similar conclusions.

Woodbury encountered failure in attempting to apply conventional methods of racial diagnosis to his material and made his study by comparing his groups character by character. Seltzer, by comparing the characters, produced a concept of a Southwestern Plateau race. Both agree that from Basket Maker II onward they could find no evidence of extensive admixture of relatively dissimilar immigrants, with the probable exception of Seltzer's Pueblo IV Rio Grande material.

Both of them emphasize the danger of associating physical with cultural characteristics when the archaeological evidence does not warrant it. This has tremendous implication for archaeology. We are all familiar with the anthropological technique of associating physical characteristics with certain minor details of material culture and postulating the spread of this "complex" in extreme cases geographically for thousands of miles and chronologically for almost as many years. The reconciliation of this technique with observable phenomena of cultural change and physical evolution is a paradoxical situation which does not seem to bother some of our most famous colleagues.

A number of general limitations arise from this rapid survey of the physical situation in the Southwest which prevent our reaching any sort of satisfactory conclusion at this time. The most important are that:

1) The number of specimens available is ridiculously small.

¹¹ S. L. Washburn has recently commented on this situation. Discussing physical anthropology in general, he attacks the assumption that classification and accurate description alone can solve our problems. He writes (see Washburn and Detwiler, 1943, pp. 171 *et seq.*): "An example of a problem which has been the subject of debate for over 80 years is the question of what factors determine the form of the braincase. Is the shape of the braincase due to the brain, to the muscles of mastication, or to both of these and still other factors? Numerous papers have championed every possible point of view and the whole controversy has been reviewed recently by Weidenreich (1941) . . . there is still no agreement. The views of Hrdlička and Weidenreich are as far apart today as were those of Virchow and Fick in 1859."

Washburn continues with the suggestion that, although biological experimentation seems impossible on human beings and difficult on other primates, it can be done easily on small, inexpensive, "laboratory" animals which grow rapidly. He maintains, it seems

2) The factors which contribute to physical change in the skeleton are still imperfectly understood; not only the actual mechanics of physical inheritance but also the effects of environment, muscular development, and nutrition present a number of variables which the scientist can not as yet control in his analysis.¹¹

Therefore, it seems that the Basket Makers are not "dolichos," the Pueblos are not "brachys," and at present, on the basis of physical anthropology, we can reach no reliable positive conclusions.¹²

I feel, however, that we can go so far as to conclude that *there seem to be no good grounds* for the assumption of a Pueblo invasion at the conclusion of the Basket Maker period. To continue to use such an assumption in our archaeological reconstructions, in view of this doubt and in view of the strength of the evidence for general cultural continuity, *would seem to be extremely unwise.*

to me with reason, that "Man is a mammal, and it would be strange indeed if the laws which govern the human body were different from those which control other animals. . . . To require that physical anthropology limit itself to the primates is like insisting that medical research cease using laboratory animals. Simply because the results of this research are to be used for man is no reason to insist that all investigations be carried out on human beings."

Washburn's plea for work by physical anthropologists in co-operation with experimental biologists is followed, in the paper cited, by a description of an experiment. It was successfully performed on salamanders to obtain evidence on a point about which there are many shades of opinion among anthropologists.

¹² Strangely enough two of the earliest reports of differences in Southwestern skulls attribute that difference to artificial deformation rather than to racial divergence. See "H," 1894, p. 154 and Montgomery, 1894, pp. 233, 306.

THE PRESENT SITUATION

Pride induces some men to dictate; indolence makes others like to be dictated to. You will not let this mislead you. You will dare to think for yourself.

— PETER BECKFORD

WE HAVE now surveyed previous archaeological work in the Mesa Verde area, described step by step the development of the Pecos Classification, summarized briefly the concepts of the Hohokam, Mogollon, and Patayan cultures, made a general study of the basic principles of taxonomy, and considered the latest findings in the physical anthropology of the Pueblo Indians. What, then, viewed in the light of all this, is the present position of Southwestern archaeology?

In attempting to answer this question certain outstanding points raised in the preceding sections of the report must be kept in mind:

1) Despite the greater activity in the Southwestern field, in comparison with many others, the amount of scientific excavation has been actually little, and the usable evidence on hand is actually small for many of the conclusions we seek to reach.

2) There are vitally important contradictory opinions in the minds of workers in the field, some of which are expressly stated in the classificatory systems designed to aid our research.

3) The very nature of these systems and the mechanics of their application is often not clearly understood, and many of the contradictions and inconsistencies arise from this.

4) The situation with regard to physical type of the prehistoric peoples is such that almost all of the postulations of physical development which we have been using now appear to be not only worthless but also misleading.

On the following pages attempts will be made to analyze some of the more important difficulties facing us at this time. The most usual point of conflict is in the dating. The

chronological correlations of cultural events and practices within and between the 4 defined Southwestern cultures provide most of the current disputes. And differences in dating form the basis of many disagreements in which the dating itself is not, as it should be, brought into question.¹

Closely tied up with the discrepancies in dating are 2 classes of concepts which are fundamental to archaeological studies. One has to do with the origins of traits and with the origins of complexes and cultures after these classificatory schemes, for that is what "complexes" and "cultures" are, have been set up. The other is concerned with the direction of influences, with the track of diffusion of a trait once it has been introduced. Unfortunately, the direction in which a trait has moved seems too often to have been decided not upon the basis of sound evidence, but upon the desire of the particular investigator impelled by the exigencies of his thesis. A specific characteristic is called a Pueblo trait, or a Hohokam trait, or a Mogollon trait before the fact that it actually occurs first in that particular culture has been satisfactorily demonstrated. This practice introduces a definite factor of prejudice. The importance of dating here is obvious. If relative dates are based upon insufficient evidence, theories of diffusion supported by them may be unsound.

In connection with this discordance in dating there are 2 sins which we commit, so widespread that they are almost accepted as venial. Unfortunately, however much we may sympathize with and understand the "natural" failings of mankind, such forgiveness is contradictory to practical scientific procedure. The first of these is the tendency to view the area in which one is working as the most important

¹ Even our tree-ring dating must be very carefully scrutinized. A healthy sign of the abandonment of our hitherto uncritical acceptance of the publications

of the Douglass school of dendrochronologists is to be found in Gladwin, 1943, pp. 55-69.

area, the type-center, the fountainhead of diffusion, and, in terms of "cultures," the norm of development. The second tendency may be labeled the *one-way argument*. By this I mean the presentation in publications and teaching of only one possible theory when the evidence is not contradictory to other theories. This is definitely unscientific procedure. There should be no bar to the expression of one's opinion after all of the possibilities which the evidence permits have been stated. And there should be no bar to the building of an argument upon this opinion provided that it is explicitly stated that one is operating upon that assumption. But to disregard or deny all other theories which the evidence admits is unprofitable and tends to retard rather than to advance our studies. When this is done, the opinion is cited by others as established fact, it is presented as fact by university teachers to their classes. Often much unnecessary effort must then be spent in analyzing the procedure, by this time perhaps firmly entrenched, and exposing its fallacies, before we can proceed with a reasonable development of our subject. The wiser procedure, I believe, is to present all explanations that the evidence permits, even though you do not believe in most of them; then, if you wish to go further, to select the one which you think the best, stating the reasons for your selection so that the reader will know what you are doing and be able to form his own opinion as to probability.²

A short statement in the introduction of a monograph to the effect that the author realizes that the argument to follow is "theoretical" is not sufficient protection for 100 pages of unqualified dogmatic statement.

I realize that much of what I am writing will be unpopular among some of the workers in the field, but we can not, effectively, continue on the headlong course we have been following. To do so will, I am afraid, lead only to embarrassment, disgrace, and disaster. We have been in too much of a hurry. We expect to settle problems of great complication with a few weeks' excavation and a few months' study. We are all familiar with statements like: "So-

and-so is conducting a 3-year program in Charcoal Gulch. This will settle the Mogollon problem for good and all."

Many of us seem, also, to share the desires of certain philosophers, ancient and modern, who find it necessary to produce, before they die, a treatise which completely explains the universe and all life on it. Such haste, based as it must be upon both disregard and denial of most of the possibilities in the evidence at hand will not make for worth-while results. The question is, do we wish to find out what happened in the past and why it happened, or do we, like the Dictators of the present day, wish to jam our beliefs down other people's throats. We can not even, as do the Dictators, plead the urgency of administrative necessity in justification of propaganda and half-truths, which are merely other terms for what I have called *one-way argument*.

To survey the present position of Southwestern archaeology in terms of the above general discussion is a large order and one which can not be filled in the space allotted. However, a general survey can be made of the 4 major culture schemes. Emphasis will be placed upon the newly constructed Mogollon concept for a number of reasons:

- 1) It seems to be the most important subject at present in the minds of a majority of active Southwestern archaeologists.
- 2) It includes or impinges upon most of the important problems of the Plateau, of which Alkali Ridge is a part.
- 3) It seems to be the most unstable and least definite of the 4 Southwestern "cultures," even though it is considered by some to be the basic "high civilization" of the area.
- 4) Because of that instability, the history of its general adoption provides splendid illustrations of some of the procedures I think should be guarded against, particularly the undue haste exhibited by students in general in snatching at a new panacea before its nature and properties are known even by those who have produced it.

Some of the difficulties we shall encounter in attempting to analyze our problems are arti-

² A good example of practical presentation is to be found in a recent work by Irving Rouse. After Rouse has developed the theory which he favors of the pre-history of Haiti, he discusses others admissible by the

evidence under the heading, "Alternative Possibilities." (Rouse, 1939.) Nesbitt's listing of the possibilities with regard to the Mogollon is another case in point. (Nesbitt, 1938.)

ficial, produced by our taxonomic technique. I freely admit that I am somewhat baffled by the statement that a given trait is, let us say, a Hohokam trait in a Pueblo or Mogollon site, when it is not known in which area or "culture" it first appeared. We should realize and remember that the mere fact that a trait has been first described in, let us say, a Pueblo site does not make it a "Pueblo trait." This is one of the most glaring faults of our classificatory systems. They force such assumptions and the result is a peculiar warping of comparative trait lists. If we could devise some method of determining invariant indices of differences and likenesses of cultural traits,³ we might perhaps avoid this difficulty by eliminating the cultural labels. As it is, we must cope with them. The best way of doing so seems to be to demand that, before a trait may be labeled as Pueblo, Hohokam, Mogollon, or Patayan, it must be proved to have appeared in one of these "cultures," let us say the Patayan, before it appeared in any of the others. Then, if there is no reasonable doubt of diffusion, it can profitably be called a Patayan trait when found in a Pueblo site. And it must be emphasized here that dating based upon the kind of reasoning by which Gladwin assigned the dates for the early phases of the Hohokam, published in his Snaketown report,⁴ can not be accepted as proof.

The last word is a long way from being said on the scientific practicality of the kind of culture classifications we are using in the Southwest. Good examples of some of the difficulties they produce were encountered by Colton and McGregor at Winona, near Flagstaff, Arizona, where there seems to be an extensive overlapping of traits from all 4 major "cultures."⁵ My own experiences in 1939 in excavating Basket Maker III-Pueblo I sites in the Jeddito Valley of the Hopi country⁶ revealed a decided cultural overlap when compared with contemporary sites being cleared at the same time by Haury in Forestdale Valley near Showlow on the Mogollon Rim. At both

Winona and in the Jeddito the importance of dating was especially emphasized in tracing the direction in which traits were moving during what are, at present, the most disputed centuries, that is, the fourth to the tenth centuries A.D. And first of all we must have much more digging in the border areas between the geographic centers in which the major "cultures" are placed.

The reader will by now have well grasped my reluctance to confine my thinking within the restrictions of the current Southwestern culture schemes. There is no denying that they give a measure of concreteness to the discussion which is quite lacking without them. I distrust that concreteness and am trying to avoid the rigidity it demands.

However, even if one is working entirely within the established classificatory schemes, it is still necessary to justify, in terms of the rules of the game, the various cultural entities set up.

In arranging the archaeological finds of the Southwest into groups the practice has been similar to the custom now commonly used in biology in the classification of species. Groups of trait assemblages having a large number of common characteristics have been banded together in "cultures." Under this system the assemblages (sites) in any one of the cultures have more traits in common with each other than with any assemblage in one of the other cultures. Thus we obtained first Pueblo (Anasazi), then the Hohokam, then the Mogollon, and finally the Patayan, as so-called "basic cultures."

All this has been done informally. There has not been a definite, agreed-upon, set of rules for such classification. Specifically, there has been no definition of the number of traits in common or of the degree of divergence from other cultures necessary in order to permit the creation of a new basic culture.⁷

Consequently it seems legitimate, first of all, to ask the question: what is a basic culture, in terms of traits common internally and traits divergent externally? Since "basic cultures,"

³ Something along the lines of R. A. Fisher's analysis of variance; that is, a scheme wherein the variance attributable to one set of influences, let us say physiographic, could be set apart from the variance attributable to different sets of influences, historical or technological or religious.

⁴ See p. 61.

⁵ Colton, 1941; McGregor, 1937, 1941; Gladwin, 1943.

⁶ Brew, 1941.

⁷ A good example of the difficulties arising from loose usage of the term "basic culture" is cited and discussed in Brew, 1942, pp. 192-94.

like genera and species, are arbitrary concepts of the students working in the field, it seems that we should have some sort of definition so that when a new basic culture is announced, we may have some way of determining its status in comparison with the basic cultures already established. As far as I can see at present, when a student announces that he has a new basic culture, all he means is that he thinks he has got something big by the tail and wishes to obtain high status and general recognition for it while he sits down to work it out and attempt to find out just what it is. Before going any further, may I enter a plea for no more basic cultures in the Southwest until we have a workable definition of "basic culture" and a determination of the status of the four we already seem to have in terms of that definition.

In very general terms we can assay the 4 present claimants on the basis of common traits which are exclusive to each at the time of their earliest recorded appearance in the Southwest. Doing so we reach the following conclusions:

a) Pueblo: status excellent, many distinctive traits in comparison with the Hohokam.

b) Hohokam: status good, many distinctive traits in comparison with the Pueblo, though very few sites have been dug.

c) Mogollon: status questionable, very few undisputed distinctive traits in comparison with the Pueblo and the Hohokam; number of sites small.

d) Patayan: status poor, barely announced, with almost no excavation; location good, on the periphery of the area of the first three, in a region of reputed large prehistoric population; prospect good.

Further discussion of (a) and (b) in terms of status does not seem profitable here, because the difference between them forms the only determinant, informal as it is, for different basic cultures in the Southwest. It is necessary to assume that they are sufficiently distinct for the purpose, and there is now general agreement among Southwestern archaeologists that this is so. It is then possible to inquire: are the other two, the Mogollon and the Patayan,

sufficiently different from the Pueblo and the Hohokam to be granted equal status with them as basic cultures?

Let us first take the Patayan, for it will cause us little trouble. I have marked its status poor but, I wish to add, without prejudice. To date there has been very little archaeological excavation in western Arizona and in the lower Colorado River region. The Patayan culture is the old Yuman Root of Gladwin⁸ under a new and better name assigned by Colton.⁹ If ever a cultural concept was born with a silver spoon in its mouth, this one was. For it is designed to include the prehistoric civilization of the fertile valley of the Colorado, below the canyon, and of the Colorado Delta, the area in which Fray Kino found a large Yuman-speaking population in 1700. It is quite possible that at times in the past there was a greater concentration of population on this rich flood-plain than anywhere else in the Southwest or even in the whole continent north of Mexico proper.

The possible importance, to us, of this region is shown in the suggestion by Kroeber that Yuman tribes of the Lower Colorado River may have served as "filters" through which southern (Mexican) culture elements reached the lower Gila and southern California.¹⁰ These influences may very well, as Colton suggests, have come into direct contact with Pueblo culture in the Flagstaff region.

The physiographic nature of the valley and the delta holds little hope for archaeology in what may have been the seat of the civilization, but sufficient peripheral establishments probably existed behind the area of floods to give us the information we need. How far back from the river this occupation extended is a question. Gladwin classified as Yuman certain rather strikingly divergent remains in the vicinity of Prescott, Arizona, and it must be noted that the modern Yavapai Indians of that region are Yuman-speaking. Sites in the Prescott area have been excavated by Caywood and Spicer.¹¹ They considered these sites to be Pueblo, but Colton classifies them as Patayan.¹² In 1938 Hargrave excavated a site, north of Williams, Arizona, near Red Lake on the road to the Grand Canyon,¹³ which he calls Patayan as

⁸ Gladwin, 1934.

⁹ Colton, 1939a.

¹⁰ Kroeber, 1928, p. 380.

¹¹ Spicer and Caywood, 1936.

¹² Colton, 1939a.

¹³ Hargrave, 1938.

does Colton,¹⁴ along with some other sites, including Medicine Fort, in the vicinity of Flagstaff. As the basis for his classification Colton uses Yuman traits of 1700 A.D., "because we have no data on prehistoric Patayan," and shows a slightly higher trait percentage relationship between these sites and "Patayan traits" than between them and Pueblo, Hohokam, and Mogollon.¹⁵ Actually, the percentage differences are very small here and seem slightly contradictory. Unfortunately, the actual traits used are not listed, and it is not stated where the Yuman list for 1700 came from, although H. E. Bolton is cited as a reference for Fray Kino's trip during that year through the Colorado Delta country.

A tentative conclusion may be drawn here that, although there is considerable doubt about the classificatory status of the sites called Patayan in the vicinity of Prescott, Williams, and Flagstaff,¹⁶ we can admit the probability on historical and logical grounds of the presence of a prehistoric culture in the Colorado Valley and Delta sufficiently different from the Pueblo and the Hohokam to permit separate classification. Therefore, it seems to me that the prospect for Patayan is good, even though it may eventually be defined as something quite different from the concept of Patayan held at present by the archaeologists of the Museum of Northern Arizona.

Turning to the Mogollon we find ourselves very much in difficulty. The Mogollon scheme was produced at Gila Pueblo during 1935 and 1936 by Gladwin and Haury, based upon excavation by Haury in west central New Mexico and upon pottery studies by the Gladwins and Haury. It has been accepted as a basic culture by many workers in the field. It was presented and widely accepted as the earliest pottery-making culture in the Southwest. Even the earliest pottery in the Hohokam, the Vahki Red ware of the lowest stratum at Snaketown, was attributed by Gladwin to the Mogollon.¹⁷ This, according to Gladwin's original dating of the Vahki Phase, would establish Mogollon pottery-makers in the Southwest prior to 300

B.C.¹⁸ The most significant point in the Mogollon scheme, and the one which is responsible for most of the difficulty, is this early date, based upon Gladwin's Hohokam dating and the above cross-check with the Vahki Phase in pottery.

It does not seem necessary, at this point, to enter into a prolonged consideration of the Hohokam dates. The method by which they were determined has been previously described.¹⁹ The significant fact for this discussion is that, although the Hohokam may be very early, its dates are not satisfactorily established. There is still a difference of opinion as to the age of the Hohokam and that is the important factor for us here. As long as that uncertainty persists, we can not use the early Hohokam dates in cross-reference with other cultures as *proof* of the date of those cultures. The extreme published statement at variance with early Hohokam dating is that of Roberts, who writes with regard to the Hohokam:

"The determination of periods depends in large measure on pottery types. Some dates can be suggested on the basis of trade objects, as in the case of the Anasazi penetration, but on the whole the status is much the same as that of the Anasazi prior to the perfection of the tree-ring calendar. The time factor is largely postulated. Present evidence is that the Pioneer stage was roughly contemporaneous with Modified Basket Maker (Basket Maker III) and the beginnings of Developmental Pueblo, Colonial with Developmental and early Great Pueblo, Classic with late Great Pueblo and Regressive, Recent with Renaissance, and Modern with Historic."²⁰ When one of the most reputable workers in the field can make such a statement, it certainly seems that we should keep the question open.

The questions we must weigh, questions which unfortunately present evidence will not permit us to settle, are 2:

1) Shall we consider the Mogollon to be a basic culture as we consider the Pueblo and the Hohokam to be basic cultures?

2) If so, does it antedate the others, and

zona in Gladwin, 1943.

¹⁷ Gladwin, Haury, Sayles, and Gladwin, 1937.

¹⁸ See p. 42.

¹⁹ See pp. 41-42, 60-61.

²⁰ Roberts, 1939.

¹⁴ Colton, 1939a.

¹⁵ Colton, 1939a, table IX.

¹⁶ See the scientifically critical discussion of the cultures described by the Museum of Northern Ari-

greatly influence them, in the development of certain important traits, particularly in pottery and architecture?

Before going further I shall make a few general statements about the development of the Mogollon concept. First, I wish to emphasize that I do not say that the Mogollon concept is wrong. The most I shall say is that it has not, as yet, been established. It is also important to point out that Haury, its chief proponent, although he believes in it, has never considered it to be satisfactorily established and is devoting himself to the study of its validity as a basic culture. The whole-hearted acceptance of the Mogollon has been by others, workers for the most part outside of the central Mogollon area, and university teachers who have grasped it, uncritically, as a welcome and easy solution to many of the problems of the origin and diffusion of traits in the Pueblo and the Hohokam.

From the beginning some archaeologists have been sceptical of the Mogollon as a basic culture. Recently some of those who accepted it at first have expressed doubts as to the wisdom of that course upon looking more deeply into the situation. In order to show the value of this discussion and the necessity for a critical examination of the Mogollon, I shall quote some of these dissenting opinions.

Paul H. Nesbitt, who is actually excavating in the Mogollon country, writes in his report of work at the Starkweather ruin:

"The Mogollon culture is Southwestern in character and does not represent a new cultural division. Its elements are broadly similar and in many cases identical with the Basketmaker-Pueblo pattern, and there is infiltration of some ideas from the Hohokam. . . . The only major difference between the Mogollon and the Basketmaker-Pueblo is in ceramics."²¹

A. V. Kidder, in a review of Nesbitt's Starkweather report, expresses himself as "entirely in accord" with Nesbitt on the Mogollon.²²

Judd, in a summary entitled "Progress in the Southwest," says: "The Mogollon appears to

be an illegitimate whose paternity is still under scrutiny."²³

Kroeber, discussing the Mogollon in "The Present Status of Americanistic Problems," writes:

". . . Mogollon, which Nesbitt and Kidder have recently questioned as really representing a radically different stem of development. They seem justified, in view of the extreme paucity of features as yet attributed to Mogollon. The generic probability seems much greater that Mogollon will prove to be a not very highly differentiated local or temporal phase of either Hohokam or Anasazi."²⁴

Finally the classificatory uncertainty is well illustrated by Reed in the statement, "Certain of these (National Monuments) are not strictly Anasazi, probably being connected ultimately with a distinct cultural root known as 'Mogollon,' but they are of the general *Pueblo type*."²⁵ The italics are mine. Writing at a later date, Reed suggests calling both Anasazi and Mogollon by the single term, Pueblo.²⁶

On the other side we have a number of people, outstanding among whom are Haury, Gladwin,²⁷ Sayles, and Martin, who believe that the Mogollon should be considered a basic culture pattern. In his original paper on the subject Haury poses 3 questions: "Were the remains to be regarded as a peripheral variation of the Basket-maker-Pueblo complex of the north; of the Hohokam to the west; or was a third basic group represented which, up to this stage in the investigations, had not been recognized?"²⁸ His answer to this question is as follows:

"The manifestations of the culture, both racial and material, are neither Basket-maker nor Hohokam as now defined, and it can not be equated with either without many qualifications. It is therefore felt that a logical solution lies in the recognition of a third group — The Mogollon Culture."²⁹

The position then, briefly, is this. Kidder, Reed, Nesbitt, Kroeber, and others think the Mogollon is part of the Pueblo basic culture

²¹ Nesbitt, 1938, p. 8.

²² Kidder, 1939, pp. 314-16.

²³ Judd, 1940, p. 433.

²⁴ Kroeber, 1940b.

²⁵ Reed, 1941.

²⁶ Reed, 1943.

²⁷ Gladwin now (1943) seems to be climbing down off the Mogollon bandwagon.

²⁸ Haury, 1936b, p. 119.

²⁹ Haury, 1936b, p. 122.

with possibly a small amount of Hohokam influence brought to bear upon it, and with the addition of pottery types which were developed along the Mogollon Rim after introduction from an unknown source. Haury, Martin, and others believe the Mogollon to be a basic culture which exerted strong influence on the Pueblo and the Hohokam.

This difference of view-point will not be settled in 1945. However, we can profitably survey it in somewhat greater detail. The statement has already been quoted, from Kroeber, that the Mogollon, as presented, shows a paucity of distinctive cultural traits. The divisions of material culture for which significant differences are claimed are architecture, stone artifacts, and pottery.

With regard to architecture, we must consider the claim unproved, as yet. In his most recent statement with regard to his current study of sites in the Forestdale Valley,³⁰ Haury says: "In the Bear Ruin fourteen domestic buildings and one large kiva were excavated. . . . The four-post roof plan, bench, deflector-ventilator complex, central hearth and bins would identify these rooms with those of the Anasazi area. On the other hand the long side entrance, the hearth type consisting of a floor excavation without lining or coping, and the lack of stone construction and floor ridges, suggest an architectural affinity with the Mogollon culture. Shapes of houses were both rectangular and round, and there appears to be relatively little cultural significance in these variations."³¹

Most of the characteristics of these buildings at Forestdale correspond to standard architectural canons of Basket Maker III in the San Juan. The long side entrance, etc., mentioned by Haury above, does not correspond to that of seventh-century houses in the San Juan. However, in pit houses of contemporary date in the Jeddito Valley of the Hopi country, the Peabody Museum Awatovi Expedition³² excavated pit houses with all of the special char-

acteristics originally mentioned by Haury as characteristic of the Mogollon. The Jeddito sites are well within the Pueblo area. The characteristics mentioned may very well have diffused to the Jeddito from the Mogollon Rim. The important point is that we do not at present know which way these various traits moved. *As far as our present evidence goes*, they may have moved either way and some may have gone one way, some the other. We should not label them now as Mogollon. They may be part of a strong cultural development which merits designation as a separate basic culture; they, or any one of them, may be a local variation in Pueblo architectural fashion in the Jeddito, on the Mogollon Rim, or elsewhere. We simply do not know, and I hope, during the next few years, to work in conjunction with Haury to obtain evidence which may help to elucidate some of these problems.

The only structural feature which, at present, seems strongly to mark off the Mogollon is the presence of large pits, numerous at Forestdale, which Haury calls "cooking pits." These are excavations of varied size, often very large, containing large quantities of heavily burned fragments of stone, including pieces of broken stone implements. It appears as though some specialized culinary or industrial practice was carried on at these sites.

With regard to stone implements the case for the Mogollon is not much stronger. Nesbitt in his Starkweather report³³ maintained that, in Mogollon sites excavated at that time, metates, manos, axes, and stone pipes were identical with Pueblo types. He also said that he found "nothing very distinctive about the Mogollon chipped implements." These remarks referred to sites which were contemporaneous with middle and late Pueblo I in the north.

On the basis of excavations in earlier sites on the Mogollon Rim Haury now believes Nesbitt is correct in his conclusions as to general similarity between Pueblo and Mogollon stone work.³⁴ However, he still feels that further

include either pictures of the earliest pit houses in the Jeddito or the tree-ring dates. This material will be published in the Awatovi series of the Peabody Museum Papers.

³⁰ Haury, 1940, p. 15.

³¹ Since this was written Haury has abandoned altogether any effort to show a distinctive Mogollon architecture. In a personal communication he has stated that he now believes that Mogollon house type is indistinguishable from Pueblo.

³² Brew, 1941; a preliminary report which does not

³³ Nesbitt, 1938.

³⁴ Personal communication and Haury, 1941, pp. 111-13.

study will establish minor differences in metates and certain chipped-stone implements following trends indicated in the San Pedro stage of the Cochise culture.

The pottery found in the sites provides the Mogollon with its strongest claim to distinction. The wares, in the earliest phases, were plain brown, plain red, and black (smudged). Later painted wares appeared, with designs in red and brown on a buff background.³⁵ Two characteristics of pottery from these sites are outstanding when compared with the wares of most parts of the Pueblo area:

1) The red color, in contrast to the gray color, called white, of standard early Pueblo ceramics.

2) The high polish found on these wares, including the plain brown "utility" wares.

The highly polished red wares, San Francisco Red and Forestdale Red, are characterized by an all-over red slip. The wide distribution of these and similar wares is, I believe, the fundamental cause behind the construction of the Mogollon complex and is, certainly, its strongest support at present. It is believed by many to have been the earliest pottery in the Southwest. Those among its proponents who, because of the early date of the first Basket Maker III pottery wares, are not prepared to go so far as this, believe that most of the ceramic improvements found in Pueblo I and Pueblo II wares were brought about by Mogollon influence. Haury is of the opinion that "polishing, slipping, neck-banding, and smudging were all early in the Mogollon Complex and were later taken over by Anasazi" (Pueblo).³⁶ This may very well be the case, but it is still to be proved. The possibility that one or all of these traits diffused the other way can not, as yet, legitimately be ruled out. There is also the possibility, suggested by Nesbitt and others, that some of these traits may have spread into the Mogollon Rim and the definitely Pueblo parts of the Colorado Plateau approximately simultaneously from some outside source.

At the present stage of our Southwestern

³⁵ For description of these wares, refer to Haury, 1936a; Colton and Hargrave, 1937; and Martin, Rinaldo, and Kelly, 1940.

³⁶ Dr. Haury has very kindly given me permission

studies the last possibility is worthy of consideration, because it not only involves some of the popular theories of the past but it will also probably play a prominent part in archaeological thinking during the next few years. Polished red ware, as a whole, apparently has a very wide distribution. Its occurrence in eastern New Mexico and farther east in the Mississippi drainage led Gladwin to assume an eastern origin for the Mogollon. Difficulties in dating and a general belief that the red wares of the Arkansas and other south-central drainages are relatively late have caused the abandonment or, at least, temporary hibernation of this theory. There is, however, no proof that it is incorrect.

Recent research in Mexico presents another possibility. For a long time "Southwesterners" have denied the possibility of cultural influences from Mexico during the periods under discussion. This opinion has now become sufficiently tempered to permit, again, consideration of diffusion north across the present border. The late George C. Vaillant³⁷ has described red pottery in Mexico which presumably may have a bearing on the problem. More recently G. F. Ekholm in "The Maya and Their Neighbors" made the following statement about sites observed by him in the State of Sonora: ³⁸ "In the course of our recent survey there were found in Sonora several significant hints as to the cultural connections between Sinaloa and the Southwest. A series of sites located near the town of Huatabampo on the lower Mayo River exhibits a culture which seems to have been in certain basic traits Southwestern in affiliation. The most characteristic pottery found at this site is a fine hard redware, . . . The location of these sites on old almost-obliterated courses of the Mayo River makes it appear that the remains are of considerable age, and this favors our opinion that the redware may possibly be affiliated with the early redwares of the Hohokam or Mogollon cultures of southern Arizona and New Mexico which they somewhat resemble."

Again, we can go no further at present because of the absence of relative dating. Enough

to quote this statement from a letter to me dated December 18, 1940.

³⁷ Vaillant, 1932.

³⁸ Ekholm, 1940, pp. 325-26.

evidence has now accumulated, however, to make a thorough study of these polished red wares worth while.³⁹ Whether or not this trait is associated, constantly, with enough other traits to justify the assumption of a widespread Mogollon culture is a collateral problem, the solution of which will entail a large amount of excavation in widely extended areas. The significance to our discussion of the hazy definition and loose use of the term "basic culture" is apparent here.

The foregoing discussion must not be interpreted as a denial that differences exist between the sites on the Mogollon Rim and those of the balance of the Southwest. Certain differences do exist and the differences of the eighth century may have had (as Haury and Reed believe) a significant bearing on later developments in the Pueblos of the Little Colorado and the Zuni as well as the Mimbres regions. *This, however, is a common situation and a similar statement could be made about almost any area of comparable size that one might select in the Southwest.*

It seems to me that we must conclude, and with this Haury is in agreement, that the concept of Mogollon culture is far from being established as an aggregation of a sufficient number of cultural traits to permit us to consider it on a par with Hohokam and Pueblo. It can not, logically, be established as such on the basis of a few ceramic traits, no matter how important those traits are in the history of the development of Southwestern pottery.

We now come to the importance of the Mogollon and the Hohokam in relation to prehistoric developments on Alkali Ridge. At the outset we are barred from definite conclusions because of the absence of reliable dates in the Hohokam and because of the ambiguous status of the Mogollon. We must deal, largely, with published theories of variant degrees of probability. The archaeological profession in the Southwest has been divided into those who favor the "north" and those who favor the

"south" in the matter of the invention and dispersion of important cultural traits. As in the case of the popular anthropological controversy of "invention versus diffusion," it seems to me that the only profitable basis on which to proceed is to assume that any given site or culture is made up by the combination of the two. The simplification involved in "theoretical exclusiveness" in anthropological thinking is one of the greatest barriers we have to surmount.

My work has been in that part of the Southwest known as the "north." However, I have no personal stake in any particular region and I have tried to divorce myself from geographical bias. I shall present the most important questions of relationships between the San Juan, the Mogollon Rim, and the Gila Basin as I see them in the light of present evidence.

So great is the emphasis on pottery in the Southwest and so great is the reliance upon surface collections for information in many of its geographical divisions that we can continue this discussion, profitably, only in terms of ceramic traits.

The first of these to be considered is the question of the original appearance of pottery in the Southwest. There are those who believe it was brought into the area by the so-called Mogollon, and there are those who believe it was invented independently in the San Juan. In examining these 2 theories, we can start with the fact that the earliest pottery in the Southwest with undisputed dating by the tree-ring method is found in the San Juan. Earl Morris in 1927 and more fully in 1939⁴⁰ has presented a theory of independent invention of pottery in the San Juan. It can not be considered as proof, but it advances the strongest body of evidence I have yet seen for invention of pottery anywhere in the world. I believe it is too early to discard it entirely. That it is true certainly seems unlikely. Most workers in the field now consider that pottery diffused into the Southwest in some way from the high

³⁹ Haury's most recent work in Forestdale Valley presents the strongest evidence to date of the antiquity of the "southern redwares." (Douglass, 1942 and Haury, 1942.) A date of 330 A.D. has been assigned to the Bluff site on the basis of tree-ring material checked and "considered sustained" by Douglass. Haury believes that further work may establish the fact that red

or brown pottery was present in southern and central Arizona before the first gray ware appeared in the San Juan. His final statement is "while the evidence from the Bluff Site is still not conclusive it is nevertheless in support of this line of reasoning."

⁴⁰ Morris, 1927, 1939, pp. 20-23.

cultures of Middle America. Yet I shall repeat some of Morris' argument here, for I believe it should not as yet be forgotten.

This theory has been shelved by many because of an unwillingness to consider the possibility of the invention of so complicated a trait more than once, or at so late a date in the history of the world, particularly that part of the process which is the firing of the vessel.⁴¹ Morris describes various uses of clay and adobe mud in pre-pottery sites of Basket Maker II, including plaster linings for storage cists, tempered with vegetable material, and goes on to say: "In fact, I do not see how the people could have remained long unaware of the alteration produced in clay by heat. Their houses were destroyed by fire with great frequency and often the roof- and wall-clay was turned to brick. Any attempt to remix the clay from a burned dwelling for use in coating another would have shown it to be proof against moisture. Moreover, in a surprising number of cases, the early dwellings were consumed together with all that normally would have been inside them except human occupants. Mud (un-baked clay) vessels found today in rooms thus destroyed, while not good pottery, are sufficiently hardened not to melt upon contact with water. In digging about among the debris of conflagration which gradually cluttered nearly every cave, it would have been difficult not to have observed the metamorphosis of portions of the mud bowls to ceramic shells. . . ."

The statement is often made, in opposition to this theory, that Basket Maker III pottery is too "good" technically to be a first effort. Some of it is certainly regular and smooth, but much of it is not. We must not disregard the fact that the so-called Basket Maker III period, with pottery as its chief diagnostic, now extends for upwards of 400 years before 700 A.D., by tree-ring dating. Some of the early pottery from the Durango region is, I believe, sufficiently coarse in texture, uneven in form, and crude in decoration to satisfy perfectly in this regard.

⁴¹ If this objection to possible instances of independent invention of pottery in the New World is allowed, on the grounds stated, then I do not see how we can assume invention of pottery at all in the New World. Pottery in Old World sites is dated millennia before

It may perhaps be valuable to point out an apparent contradiction, here, in that some of the very people who advance that criticism also point to the great technical superiority of Mogollon wares to illustrate how much further along they were than the Basket Makers.

This brings us to the question of the "Mogollon types" of pottery, highly polished brown, red, and smudged wares, which occur in some of the sites in the "north." With regard to them Morris says: "But none of it has come from sites dated to prove the priority of its appearance in the south. Hence, the status of the burnished red pottery of the north cannot be fixed until positive dating and technological analysis have determined its relationship." However, the occurrence of such pottery in the north is still an interesting problem. It puzzled Kidder and Guernsey when they found it in the Tsegi, and Haury now considers it to be the strongest evidence of Mogollon influence on early Pueblo wares.

The second point, which brings us closer to Alkali Ridge, is the question of red pottery, that is, pottery fired in an oxidizing flame, but which does not otherwise closely resemble Mogollon pottery. One of the outstanding discoveries of the Peabody Museum Southeastern Utah Expedition was that, with the exception of a handful of sherds, the earliest painted pottery on Alkali Ridge, called Abajo Red-on-orange, was decorated with red paint on an unslipped orange background (see p. 247 and figs. 101, *o-v*; and 102). Later Martin found a large proportion of similar ware in nearby sites across the line in Colorado. In smaller proportions it also occurred in many of Morris' sites in the La Plata region east of Mesa Verde, and it has been found in Chaco Canyon in northwestern New Mexico by archaeologists of the University of New Mexico.

In the report of his work in 1939 on the Mogollon Rim Martin says, in regard to this ware: "The origin of this pottery, which is atypical of Basket Maker wares, has been guessed at. Some thought it was an independent invention and local development of the

any ceramic objects in the New World. I do not believe that many Americanists are prepared to explain all New World pottery on the basis of diffusion from Eurasia.

Basket Maker people. I concurred in this conjecture at one time. But the more Rinaldo and I studied this red ware the more we felt inclined to agree with the verbal suggestion made by Dr. Emil Haury — that Abajo Red-on-Orange pottery was somehow tied up with Red-on-Brown Mogollon pottery.”⁴² Aside from the question-begging statement about its being atypical of Basket Maker or Pueblo wares, when it actually is found in a large part of the San Juan, this statement merits serious consideration. The designs on most Mogollon Red-on-brown wares resemble closely many of the designs on Pueblo I and Pueblo II black-on-red wares and the dates correspond very nicely for this relationship. This resemblance, however, does not extend to the designs on Abajo Red-on-orange pottery. Both Haury and Gladwin upon looking over the Alkali Ridge collections remarked that the Abajo Red-on-orange pieces did not resemble Mogollon wares. This is another question which, it seems to me, we must not consider settled. Further progress with it must await more excavation, with dates, of sites wherein the earliest painted pottery in the Mogollon region is found.

Additional discussion of the Mogollon problem and a summary of possible relationships between the villagers of the San Juan and the Mogollon Rim will be found on pages 292-94 in the Conclusion.

There is even less resemblance between the Alkali Ridge ware and the Red-on-buffs of the Hohokam. There is, however, one ware found in the south which, in small part, bears a striking resemblance to the Abajo Red-on-orange. This is the Dragoon Red-on-brown found by Fulton near Dragoon and Gleeson in southern Arizona.⁴³ A comparison of figure 3, in the report of the excavation of the Gleeson site by Fulton and Tuthill, with the figures in this report illustrating designs from bowls found at Site 13 on Alkali Ridge will show 4 examples of almost identical design treatment. The parallelism is too striking to be disregarded, but its meaning is for the future to interpret.

Again we must return to the dating. There are no tree-ring dates for the Dragoon sites.

Fulton places them “from around 800 A.D. to 1200 A.D.”⁴⁴ This is later than the occurrence of Abajo Red-on-orange at Alkali Ridge. On the basis of tree-ring dates from houses in which the latter ware was found at Site 13, we believe it was present there in large quantity before the middle of the eighth century. On the other hand, it must also be considered that Dragoon Red-on-brown may be older than estimated by Fulton.

We can, then, go no further than to agree with Haury, as quoted by Martin, that there may very well be a cultural relationship between the Abajo Red-on-orange ware of the San Juan and certain red wares of the south. The question as to which came first, if this relationship was direct, we can not answer now, and I believe it is unprofitable to pursue it further without more excavation.

There is one other idea I should like to present, however, in this connection. The type of pottery design which is found on both the Abajo Red-on-orange and the Dragoon Red-on-brown is also found on Basket Maker II and Basket Maker III baskets. Is it not possible that in our emphasis on pottery we have overlooked a very important fact; namely, that some of the designs whose diffusion we are tracing were distributed about the Southwest *before the advent of pottery*? The importance of this is that correspondence in such designs may indicate a relationship much earlier than the time at which the pottery was being made. Conversely, then, it need not indicate direct relationship during the pottery-making periods.⁴⁵

A further mechanical variation in the diffusion concept has recently been discussed in a paper by Kroeber.⁴⁶ This is the possibility of what he calls “stimulus diffusion,” and it is at present being used by some of the proponents of the Mogollon theory as a means of attributing pottery-making in the San Juan to Mogollon influence even though the early San Juan pottery does not resemble the early Mogollon. The concept is good. As applied to archaeology, it envisages the spread of an idea for the manufacture of an artifact apart from concrete examples of the product. Precisely, I under-

⁴² Martin, Rinaldo, and Kelly, 1940, p. 10.

⁴³ Fulton, 1934, 1938; Fulton and Tuthill, 1940.

⁴⁴ Fulton and Tuthill, 1940.

⁴⁵ For further discussion of the point, see page 265 and figs. 67; 175, f, g; 191, e, h.

⁴⁶ Kroeber, 1940a and 1940b.

stand this to mean that the idea of and specifications for making pottery might be picked up in conversation and put into practice by a person who had never seen a pot or who had never seen one made. This is certainly possible, but it is even more certainly a very dangerous anthropological concept, to be used with extreme care. It has 2 obvious disadvantages: (1) it is too convenient a panacea, and can very easily be overworked as a substitute in cases where material evidence of cultural connection is lacking; and (2), as Morris says with regard to its application to pottery-making in the San Juan, it "is a point which unfortunately can never be checked by empirical evidence."⁴⁷

What, then, is the present situation with regard to the interrelationship of Hohokam, Mogollon, and Pueblo? We have first to consider the status of the Mogollon, which seems to have been put forward as a basic culture on insufficient evidence. And even if it should come to be established as an important basic culture, the question of relative date still must be settled before it can be accepted as a power-

⁴⁷ Morris, 1939, p. 23.

⁴⁸ Although Gladwin has now revised upward by almost 1000 years his dating of the earliest Snaketown Phase, I leave this as originally written, because a few people still hold to his early date for the Hohokam and use it in cross-dating with Mogollon.

⁴⁹ A tentative hypothesis is presented in Beals, Brainerd, and Smith, 1945 (pp. 119-20) that the Sacaton Phase of Hohokam, dated in the Snaketown report as 900 to 1100 A.D., may actually have been 1200 A.D., or later. This possibility is based on a sudden change in Hohokam pottery design at the beginning of the Sacaton Phase. "... diaper patterns suddenly appeared, showing a sharp contrast to the preceding naturalistic, all-over patterns of earlier Hohokam

ful determinant in conditioning traits of early Pueblo cultures.

As our knowledge stands at present, any one of the 4 cultures may have been the earliest, but I suspect, and here my doubt of the mechanics of our classificatory system comes out again, that we shall experience insuperable difficulty in maintaining this concrete 4-fold division as we proceed backward from the general time-level of 700 to 900 A.D., just as we can not maintain it as we go forward from that period. In other words, *the 4-fold system actually works, at present, if it works at all, only for the cultural span corresponding to Pueblo I in the Pecos Classification.*

With regard to estimated dates, Gladwin may perfectly well be correct in believing the Hohokam and the Mogollon to be as early as he has placed them. But he certainly has not proved it.⁴⁸ As far as the evidence goes the Hohokam may even be a little later than indicated in the quotation from Roberts on page 78.⁴⁹ We do not know, and, as long as we do not know, I insist that we take into consideration all possibilities that the evidence permits.

phases. These Hohokam diaper designs are markedly like Tusayan style patterns in arrangement, showing even more strongly several features which are suggestive of decadence from the original Flagstaff (Black-on-white) patterns, . . . The probability of a direct influence of Tusayan style . . . on the Hohokam, or vice versa, may be considered slight because of the distance and of the absence of trade fragments. . . . On the other hand, a common origin in pottery of the centrally located (and thickly populated) Flagstaff area seems a logical hypothesis." This item refers to a later period in the Hohokam than the times we have been dealing with in this chapter. But, with a 1945 date-line, it serves to emphasize that the last word is far from spoken on Hohokam dating.

LIST OF EXCAVATIONS

THE Peabody Museum Southeastern Utah Expedition excavated the whole or part of 13 sites on Alkali Ridge. Their locations are shown in figures 3 and 4. The total number of structures excavated during the 3 seasons was 195 storage and living rooms, 15 pit houses, and 14 kivas; 224 rooms in all. This figure does not include all of the work done,

because of the considerable areas cleared at some sites without finding definite outlines of rooms. Nor does it include isolated fireplaces, small bins inside or outside of rooms, or the southern antechambers of pit houses, which in some cases could be counted as rooms. A preliminary brief listing of the work done at each site follows.

TABLE 1. List of excavations.

Site	Rooms Excavated	Pit Houses Excavated	Kivas Excavated	Refuse Mound Excavations
*Ab:7: 1 Unit 1	4	..	1	partially excavated
Ab:7: 1 Unit 2	..	..	1	
*Ab:7: 2	5	..	1	trenched
*Ab:7: 3	4	..	1	trenched
*Ab:7: 4	1	..	..	no mound found
*Ab:7: 5	2	..	2	completely excavated
*Ab:7: 6	4	..	1	completely excavated
*Ab:7: 7	3	1	1	trenched
Ab:7: 8	1	..	..	trenched
*Ab:7: 9	4	..	1	completely excavated
Ab:7:10	no excavation			
*Ab:7:11	2	..	1	trenched
*Ab:7:12	13	..	2	completely excavated
Ab:7:13	152	14	2	
Totals	195	15	14	10

* At the sites marked with asterisks all structures located were excavated.

CHRONOLOGICAL RELATIONSHIP OF THE SITES

THIRTEEN sites were excavated on Alkali Ridge. It will be seen from the map (fig. 3) that they lie within a range of 8 miles in a north-south direction. The mesa-top abounds in sites. Twenty sites were found in 4 quarter-sections, an area 1 mile square, in the vicinity of Site 13, as shown in figure 4, and it is highly probable that we did not find them all. Observations during the 3 field seasons gave us no reason to believe that the large occurrence of sites in this particular section was unusual. It would probably not be difficult to find a square mile containing even more sites.

possible completely to "fit" the material found into the systems and the results will be presented in 2 ways. First, the sites will be described in the order in which they were excavated. Second, various items of material culture, such as architecture, pottery, tools, and ornaments, refuse mounds, etc., will be presented in developmental sequence.

It is generally customary in Southwestern archaeology for students to present their material in terms of one, only, of the current classificatory systems, that one which the particular student prefers or finds most practical.

TABLE 2. Classification of sites excavated on Alkali Ridge.

Site	Pecos Classification	Roberts' Revision of Pecos Classification	Gila Pueblo Phase System
Ab-7: 1	Pueblo III	Great Pueblo	McElmo and Montezuma Phases
2	Basket Maker III Pueblo II and III	Modified Basket Maker through Great Pueblo, inclusive	La Plata through McElmo, inclusive
3	Pueblo II	Developmental Pueblo	Mancos Mesa
4	Insufficient evidence	Insufficient evidence	Insufficient evidence
5	Pueblo II	Developmental Pueblo	Mancos Mesa
6	Pueblo III	Great Pueblo	McElmo
7	Basket Maker III to Pueblo II, inclusive	Modified Basket Maker and Developmental Pueblo	La Plata through Mancos Mesa, inclusive
8	Pueblo II	Developmental Pueblo	Mancos Mesa
9	Pueblo II	Developmental Pueblo	Mancos Mesa
10	Pueblo II	Developmental Pueblo	Mancos Mesa
11	Pueblo II	Developmental Pueblo	Mancos Mesa
12	Pueblo II	Developmental Pueblo	Mancos Mesa
13	Basket Maker III to Pueblo III, inclusive	Modified Basket Maker through Great Pueblo, inclusive	La Plata through Montezuma, inclusive

Sites on Alkali Ridge represent the entire span of pottery-making cultures described for the Mesa Verde area in the systems of culture classification now in use. Because of the extreme simplification of these systems in relation to the mass of cultural detail uncovered in the Peabody Museum excavations, it has not been

To students using a different system this presents a difficulty of interpretation and necessitates translation — a situation which is irritating and perhaps unfair. The reader feels a certain amount of antagonism and believes the writer to be an "old fogey" or a "young radical" as the case may be.

In this report I shall attempt to alleviate the situation by relating our findings, at intervals, to the several systems which seem to apply to them. At the outset I shall list the chronological relationships of the sites dug in terms of 3 systems: (1) the Pecos Classification; (2) the revised Pecos Classification, devised and used by Roberts,¹ and applied to the Mesa Verde area by Martin² in his Ackmen-Lowry work; and (3) the Gila Pueblo Phase System designed by Gladwin and others at the Hohokam Conference.³ No correlations will be given in the table below with Colton's revision of the Gila Pueblo System,⁴ because he has not, as yet, published descriptions of "foci" for the Mesa Verde region. However, assignment to the Museum of Northern Arizona System, as well as to the other three, will be found in small tables entitled "Taxonomic Position" which occur near the end of the description of each site.

Because of conclusions reached during the course of our field work, 1931-33, I shall con-

sider "Prudden Unit-type" houses and McElmo Black-on-white pottery to be diagnostic of Pueblo III and not of Pueblo II in the Pecos System. This procedure has been followed by Morris in his classification of La Plata sites and is used in the Gila Pueblo Phase chart.⁵

In terms of the Gila Pueblo Phase System the sites dug may all be assigned to the Mesa Verde Branch of the San Juan Stem of the Basket Maker Root.⁶ In the Gila Pueblo Phase chart published by Gladwin⁷ there is a gap in the Mesa Verde Branch in the eighth and ninth centuries A.D., correlated, in the chart, with the Pueblo I period of the Pecos Classification. On the basis of the Alkali Ridge excavations part of this gap, in the eighth century at least, could be filled by the installation of a phase which might be called "Abajo" after Abajo Red-on-orange pottery, the pottery type characteristic of Alkali Ridge Site 13 dated by tree-rings in that century in the Mesa Verde area.⁸

The sites excavated on Alkali Ridge may be classified as shown in table 2.

¹ Roberts, 1937, 1939.

² Martin and Rinaldo, 1939.

³ Gladwin, 1934.

⁴ Colton, 1939a and 1941.

⁵ Morris, 1939; Gladwin, 1934, fig. 8.

⁶ For criticism of family trees in baked clay, see pp. 41-42.

⁷ Gladwin, 1934.

⁸ I have defined such a phase for the Gila Pueblo System on p. 92.

TREE-RING DATING

ONE of the greatest technical advances in archaeology has been the development of dendrochronology. A. E. Douglass, an astronomer engaged in the study of the effect of sun spots upon climate, is responsible for the valuable theory that, since relative annual amounts of precipitation are reflected in the size of the annual rings in trees, the wood found in prehistoric ruins may be dated with sufficient accuracy to permit incorporation of the dates into our modern calendrical system. Descriptions of the techniques of tree-ring study are to be found in papers by Douglass, W. S. Glock, W. S. Stallings, and H. S. Gladwin.¹ Practical application to a particular ruin involves 3 major prerequisites: (1) there must be available for the area in which that site lies a tree-ring record from actual specimens extending as far back in time as the date of the site in question; (2) wood of species with ring growth sufficiently sensitive to annual varia-

tions in climate must be present in the site in pieces large enough so that they may be compared with certainty to that record; and (3) these pieces of wood must have been found and excavated in such a manner that they can be associated convincingly with cultural features at the site, preferably with specific buildings.²

Two of these 3 conditions were admirably fulfilled on Alkali Ridge. The second one of the three, proper datable pieces of wood, we found only at Site 13. At the other 12 sites large amounts of tree-ring material was found, including numerous logs from roofs and walls of buildings, but every piece was of wood which can not, at present, be dated by the methods of dendrochronology. Almost all of it was juniper, and its use is characteristic of Pueblo II and small Pueblo III sites in the Mesa Verde area. This is unfortunate for archaeologists, but we should not complain too bitterly since it was the best wood, readily available,

years and had been reconditioned with a new roof. However, we then should have the date of that roof, which would be important. Obviously, the really useful and trustworthy dating is the kind that Haury was able to work out in his Canyon Creek cliff house in east-central Arizona. There he had numerous dates from many different structures (see Haury, 1934, pp. 55-58). But one can even get into difficulties with a large number of specimens. At the pueblo of Awatovi in the Hopi country we obtained 143 dated specimens from the fill of a single large room. The room had originally been 3 rooms on the north side of a Franciscan friary. Then after the Pueblo rebellion the Indians had moved in and had cut it up into even more rooms (8) according to their own ideas. Subsequently the Friars returned and removed all the interior walls, Spanish and Indian, transforming that side of the friary into a small church because the main church had been destroyed in the rebellion. The 143 dated specimens ranged, in cutting dates, estimated cutting dates and "plus-X" dates, from 1202 A.D. to 1701 ± 1 , a span of 500 years, with a maximum of 50 specimens from any one century. Those 50 were from the sixteenth century, and the building of the friary was not authorized until 1629, in the seventeenth century.

The moral of this, as the best dendrochronologists have pointed out, is that the tree-ring men do not date our ruins for us. The most we can expect from them is the date at which the timber was felled. Beyond that, the job is ours, and it is not an easy one.

¹Douglass, 1929, 1935; Glock, 1937; Stallings, 1939; Gladwin, 1940a, 1940b.

²An unattached single piece of wood or charcoal at a site is of very little use to the archaeologist, even though dated. There are so many ways in which it can get there. It may be much earlier than the actual occupancy of the site or building, a nice dry piece of firewood brought in from a nearby Basket Maker cave. Or it may be the remnant of a much later camp fire, much later than the occupancy of the site, subsequently buried by blow-sand and rain-wash or worked into the fill through the agency of a prairie dog or tree root.

Even when the dated specimens are associated convincingly with the structure, the archaeologist is still faced with a major problem of interpretation. Beginning with the leanest evidence, a single dated specimen, the following are among the possibilities which must be considered: (1) the log in question may have been cut at the time the building was being built, and this is the ideal situation; but (2) it may have been an old log taken from an abandoned building; (3) it may have lain around on the mesa-top or at the site for a number of years before being used; or (4) it may have been a replacement for a cracked or rotted log, installed years after the building was built. So we see immediately that to get very far we must have a considerable number of dated specimens. But supposing we have 35 dated specimens, all of the same year, from the roof of a kiva. Perhaps there had been a fire, or perhaps the kiva had been disused for a number of

for the purposes to which it was put by the prehistoric builders. Since we have had so much from the students of tree-rings, it is natural for us to ask for more. A practical technique for dating juniper would be of tremendous help in the San Juan.

laudable caution in refusing to assign dates of which he could not be reasonably certain.

As this report goes to press severe criticism is about to be leveled at some of the findings and at certain aspects of the techniques of the "Douglass school" of dendrochronology. The

Site	Room	Assoc.	Spec. No.	Wood	Condition	Form of Spec.	Inside Dated Ring	Outside Dated Ring	Rings Absent	Rad. mm.	Rings Lost Outside	Estimated Cutting Date
13	Pit House A	Roof	LA-U6	Pinyon	C	Frag.	713	763	0	58	Few?	770±10
13	100A	Roof	LA-U12	Yellow Pine	C	½ sect.	724	765	0	60	Few	
13	100A	Roof	LA-U13	Yellow Pine	C	½ sect.	730	760	0	45	Few?	
13	100A	Roof	LA-U14	Yellow Pine	C	½ sect.	727	759	0	42	0?	
13	Pit House G	Roof	LA-U15	Yellow Pine	C	Frag. sect.	724	766	0	75	Few	
13	Pit House F	On floor	LA-U18	Pinyon	C	Frag. sect.	624	768	0	60	Few	

TABLE 3. Alkali Ridge tree-ring specimens collected by Peabody Museum and dated by W. S. Stallings, Jr., at the Laboratory of Anthropology, Santa Fe.

At Site 13 on Alkali Ridge we were fortunate to obtain a small number of datable pieces of charred yellow pine and juniper. Fourteen specimens, mostly from burned roof timbers, have been dated. Eleven came from ground-level living rooms and 3 from pit houses. Three had remnants of bark still adhering and in these cases, if the technique is accurate, we should have the dates when the timbers were cut, within a year. The dates assigned to these 3 are all in the eighth decade of the seventh century A.D.; 771, 772, and 777. For 6 others the estimated cutting date has been set at 770±10. The dates assigned to the outside dated ring of all specimens ranged from 759 to 777. Six of the specimens were dated by W. S. Stallings, Jr., at the Laboratory of Anthropology in Santa Fe and 8 were dated by the late J. H. Denison and Harold Gladwin at the Gila Pueblo tree-ring laboratory at Santa Barbara, California. I am very grateful to these men and to their institutions for the time spent, mostly on miserable specimens, and also to E. W. Haury for his valiant attempt to date the juniper from the Pueblo II sites and for his

coming storm is foreshadowed in Gladwin, 1943, pages 55-69. Some such result was to be expected whenever a wholly independent check should be made. It is gratifying that the dates listed above from the Abajo Phase of Site 13 fall within the short space of 20 years, whether dated by the Douglass technique or

Site	Room	Spec. No.	Inside Dated Ring	Outside Dated Ring
13	11A	3344	715	767
13	11A	3345	697	769
13	11A	3346	698	767
13	11A	3347	696	771B*
13	11A	3348	689	772B
13	11A	3349	700	765
13	11A	3350	701	769
13	11A	3351	691	777B

* B in column 5 indicates that remains of bark were found on the specimen.

TABLE 4. Alkali Ridge tree-ring specimens collected by Deric Nusbaum and dated by J. H. Denison for Gila Pueblo.

the Gladwin technique. Thus they seem to have the greatest possible "validity" at present. However, they are much too few in number and must not be taken as absolute determinants of date, but only as one more bit of evidence to be considered in connection with the stratigraphic and typological findings.

The 2 sets of dates are given in tables 3 and 4, above. Catalogue numbers of the specimens in the Laboratory of Anthropology and at Gila Pueblo are given in case further infor-

mation is desired. The numbers and letters in the room designations refer to figure 27. In the Gila Pueblo list the letter B after a date indicates bark remaining and signifies that the date given should be within a year of the cutting date. No estimated cutting date is given for the others in that list, because the Gladwin group does not at present trust such estimates, particularly with charcoal specimens, when more than a very few of the outer rings have been lost.

ABAJO PHASE AND ABAJO FOCUS

Those "conservatives" who prefer the Pecos system, and feel that the new system creates unnecessary complexity, are at liberty to follow it. They can translate these foci and branches into a broader horizontal system more easily than "radicals" can translate generalized publications into terms of detailed classification. Synthesis of analyzed data is less arduous than attempting to analyze generalized data.

—ERIK K. REED

ALTHOUGH I am extremely doubtful of the wisdom of the Gila Pueblo Phase System and believe many of its implications to be misleading,¹ I shall at-

tempt to fit the Alkali Ridge material into it and into the Museum of Northern Arizona Scheme based upon it.

GILA PUEBLO SYSTEM

In the Gila Pueblo Phase chart² gaps exist for the eighth and ninth centuries A.D. in the "Mesa Verde Branch." The eighth-century gap could be filled, at least in part, by a phase called "Abajo" on the basis of dated finds at Site 13 on Alkali Ridge.

Using the headings of Gladwin's individual branch charts³ the situation might be described as follows.

ABAJO PHASE

PERIOD. Basket Maker III-Pueblo I, in terms of accepted Pecos Classification diagnostic criteria for these periods.

PHASE. Abajo.

POTTERY. Abajo Red-on-orange, Abajo Polychrome, Lino Gray, Kana-a Gray.

ARCHITECTURE. Large and small pit houses; associated with Pueblos running to at least 300 rooms. The rooms consist of long, curving rows of contiguous storage chambers and large above-ground living rooms. Wall construction includes upright stone slab; post-and-adobe (jacal); adobe, sometimes in the form of "turtlebacks"; coursed masonry, best described as alternate courses of small stones and adobe; and various combinations of these techniques in a single wall. It is interesting to note that as many as three of these "wall types" were found in 1 small room at Site 13.

DATES. Eighth century A.D. by tree-rings.

TYPE SITE. Site 13 (Abajo:7:13).

MANCOS MESA PHASE

In addition, on the basis of the excavation of Sites 2, 3, 5, 7, 9, 11, and 12, the Gladwin entry for the architecture of the Mancos Mesa Phase (Pueblo II) in

the Mesa Verde Branch might be expanded from "Small House"⁴ to: jacal structures with stones imbedded in the adobe between the posts, 1- to 12-room buildings have been found, upper limit unknown; built-in meal bins were found in these; coursed-masonry buildings which were as small as 1 room, 2 rooms frequent, upper limit unknown but may be large, since part of Lowry Pueblo should be included in this phase;⁵ kivas, with and without bench and pilasters; those associated with coursed-masonry houses sometimes closely approximate in style the standard Mesa Verde kiva of Pueblo III.

MONTEZUMA PHASE

For the Montezuma Phase (classic or late Mesa Verde Pueblo III) Gladwin's architectural description is "Great Pueblo Cliff-dwellings." On the basis of the La Plata work of Morris,⁶ the Ackmen-Lowry work of Martin,⁷ and the Peabody Museum Alkali Ridge work of which this is the report, the statement might be expanded to include: large "open site" pueblos; continuance and probable numerical predominance of the "Unit-type" small pueblo.

It might also be wise, although kivas are included in the term "pueblo," to note that the "Great Kiva" is found, because this type is still associated by some with only the Chaco division of the San Juan and the region south of it. They have been found by Martin⁸ and by Morris⁹ in the Mesa Verde region. With regard to Great Kivas Morris says: "... the Great Kiva or superceremonial chamber ... is to be found rather widely distributed over the Chaco and Mesa Verde districts but so far has not been reported from the Kayenta country."

¹ Morris, 1939.

² Martin, Roys, *et al.*, 1936; and Martin and Rinaldo, 1939.

³ Martin, Roys, *et al.*, 1936, pp. 46-53.

⁴ Morris, 1939, pp. 82-84.

¹ See pp. 41-42, 60-61.

² Gladwin, 1934.

³ Gladwin, 1934, figs. 1 to 9.

⁴ Gladwin, 1934, fig. 8.

⁵ Martin, Roys, *et al.*, 1936.

MUSEUM OF NORTHERN ARIZONA SYSTEM

In applying the Gila Pueblo System to northern Arizona Colton substituted the term "focus," from the McKern Classification, for Gladwin's term "phase"; added the term "component, as used by McKern, to indicate the presence of a focus in a large site where several foci are indicated";¹⁰ expanded the list of traits in order to present much more complete descriptions than those given in the Gladwin Phase charts; and added as well an estimate of geographical distribution.

I shall define insofar as possible, what might be called the Abajo, Ackmen, and Mancos Foci in terms of the Museum of Northern Arizona System, using Colton's headings.

ABAJO FOCUS

DISTRIBUTION IN SPACE. Defined from surface surveys and excavations, to cover the northern mesas of the San Juan in Utah, Colorado, and northwestern New Mexico from Durango, Colorado, to Bluff, Utah; extent south of the river uncertain. Hawley reports certain characteristics of the focus from Chaco Canyon.¹¹ How far it is profitable to pursue resemblances must be a hard question even for the strongest supporters of the system. Many characteristics become attached to a particular focus or phase merely because first defined in that connection. Are they then to be considered to be traits of that focus or phase, and wherever found do they show the "influence" of that focus or phase? This is a good case in point. Rows of contiguous slab-lined storage bins are apparently generally characteristic of Pueblo I, judging from the excavations of the University of New Mexico in Chaco Canyon; Morris in the La Plata; Martin in the Ackmen-Lowry region; Roberts and Haury, separately, near Allantown, Arizona; and the Peabody Museum on Alkali Ridge, Utah, and in the Jeddito Valley, Arizona. But I have just listed them as characteristic of the Abajo Phase and shall presently list them as characteristic of the Abajo Focus. May I then say that they are, therefore, an Abajo trait; and would I then be justified in saying that wherever they occur in the Southwest they represent "influence" from the Abajo region of the San Juan? Certain schools of taxonomic practice would permit me to do so, but I shall not. The story of the spread of this architectural trait is still to be worked out, and I shall not attempt to impute its origin to the north by means of a classificatory technicality.¹²

But here we are, again, in the midst of "mechanical" troubles with taxonomy. I find it impossible to work

with any of the systems without such trouble. I shall try to get on with the Abajo Focus, however.

DISTRIBUTION IN TIME. Eighth century A.D., on the basis of tree-rings.

EXCAVATED SITES. Site 13, described in this report; Ackmen-Lowry 1 and 2;¹³ numerous sites in the La Plata and Mancos regions.¹⁴

UNEXCAVATED SITES. Numerous throughout the Mesa Verde area, including very large ones on top of Mesa Verde proper.

FOCUS DETERMINANTS

POTTERY. See Abajo Phase, above.

ARCHITECTURE. See Abajo Phase, above.

STONE. Tanged arrow-points (fig. 172, top row). No notched arrow-points were found in Abajo rooms at Site 13. Chipped knives and/or spear-heads with and without stems. Flat oval scrapers with secondary chipping on all major faces. Chipped drills and graters. Axes presented a wide range with notched river pebbles, chipped at the cutting edge, predominating. Full-grooved axes, made from river pebbles, and ground-stone axes present. Grooved mauls of chipped and ground stone. Hammer stones without grooves. Pitted hammer stones. Many flat, crudely chipped, notched or grooved implements of quartzite, sandstone, and limestone variously labeled axes, hoes, and loom weights. Troughed metates with 1 end open. Small paint-grinding metates. Stone mortars and bowls. Manos, shorter than later ones, with 1 or 2 grinding surfaces. Rubbing stones, rounded, with 1 or 2 rubbing surfaces. "Boiling stones." "Floor-polishers." Small polishing pebbles. "Lap stones." Flat sandstone pot covers. "Lightning stones." Pendants of shale, lignite, selenite, gypsum. Only 1 arrow-shaft smoother or straightener has been reported.¹⁵

BONE AND ANTLER. Bone awls of all 5 Kidder types.¹⁶ Spatulas. Awl-spatulas. Chisel-like end-scrapers, of split long bones with 1 end beveled off. Weaving tools. Bone tubes and beads. Incised bone dice. Whistles of hollow bone with hole drilled near 1 end. Perforated needles or bodkins. Punches and flakers. No "fleshers," or scrapers, made from deer humeri, a very common type in subsequent foci, were found.

METAL. None found.

SHELL. Scarce. *Olivella* shell bead, with the spire ground off. Snail shell, *Oreohelix houghi*, with hole through center of helix.

WOOD, LEATHER, AND FIBER. Coiled basket, single-rod foundation; coiled basket, single-rod-and-bundle foundation. Material scarce, because all of the strati-

¹⁰ Colton, 1939a, p. 9.

¹¹ Hawley, 1936.

¹² This question is discussed on p. 46.

¹³ Martin and Rinaldo, 1939.

¹⁴ Morris, 1919a, 1939.

¹⁵ Martin and Rinaldo, 1939, p. 388.

¹⁶ Kidder, 1932.

graphic excavation has been in open sites. Reconnaissance indicates that a great wealth of material exists in dry caves occupied during this period.

FOODS. Maize, beans, squash, wild gourd, pinyon nuts, prickly pears, and probably other cactus fruits; wild berries and fruits, probably including wild cherries, currants, and service berries. Wild game, including deer, rabbit, and mountain sheep. No turkey bones were found in the Abajo levels at Site 13. See the section of this report on Physiography and Ecology, for additional speculation on possible food supply.

DOMESTIC ANIMALS. Dog. No turkey bones found at Site 13.

DISPOSAL OF DEAD. No burials have been definitely associated with the Abajo Focus.

PHYSICAL TYPE. Unknown.

AUTHORITIES. Martin,¹⁷ Morris,¹⁸ and this report.

ACKMEN FOCUS

During the ninth century the architectural layout described for the Abajo Focus seemed to persist. There were, however, as would be expected, gradual changes and improvements. By the middle of the ninth century, on the basis of Martin's Site 1 in the Ackmen-Lowry region, there seems to have been sufficient change to justify, in taxonomic practice, the manufacture of a new focus, which might be called the Ackmen Focus. The tree-ring dates published for this site range from 855 to 872 A.D.¹⁹

The differences, in comparison with the Abajo Focus, were:

POTTERY. The appearance of La Plata Black-on-red, with designs for the most part similar to those on the Abajo Red-on-orange but executed in a dense black paint.

ARCHITECTURE. True coursed masonry, though very crude, in the above-ground rooms; walls of storage rooms and adjacent living rooms identical in structure; ventilators in place of southern antechambers in the pit houses; great kivas with diameters ranging from 13.17 to 24.9 meters, with peripheral coursed-masonry rooms.

MANCOS FOCUS

DISTRIBUTION IN SPACE. The geographical extent of the Mancos Focus is a very difficult problem. Lack of excavation in Pueblo II sites in many regions restricts us largely to pottery from surface surveys in assigning distribution. Here we come upon an apparently extensive generalization in Pueblo pot-

tery type which seems to have preceded the development of specialized Pueblo III styles of decoration, such as the Mesa Verde, Chaco, and Kayenta. In 1924, Kidder mentioned a style of pottery which he believed came before the Classic San Juan wares. On the basis of years of observation of small sites he presented his opinion that it was rather widely distributed over the San Juan.²⁰ His observation has been confirmed by the subsequent archaeological investigations in the San Juan. This style has been referred to in the past as "Chacoan," and it includes the pottery defined by Martin²¹ as Mancos Black-on-white. In a later report Martin says: "The term Mancos black-on-white pottery is applied to a Chaco-like ware found in southeastern Utah and southwestern Colorado. It manifests the same general treatment, appearance, and elements of design as early Chaco pottery."²²

The style under discussion also includes the ware defined as Escavada Black-on-white by F. M. Hawley. The definitions of Escavada Black-on-white and Mancos Black-on-white by Hawley are for the most part identical. She recognized that situation in the note that Mancos Black-on-white was: "difficult to distinguish from early Chaco or Escavada Black on White, as neither are distinctly specialized and both probably grew up from a slightly more southern Pueblo I East Black on White."²³ I have examined sherds of this style from Chaco Canyon and Mesa Verde on the Gila Pueblo sherd boards and have been unable to make any satisfactory distinction between them. Nor could I distinguish satisfactorily between either of them and the Pueblo II black-on-white sherds from Alkali Ridge.

The style is again apparently very similar to Dogoshzi Black-on-white defined by Colton and Hargrave,²⁴ listed by them as occurring in the Kayenta, Chinle, Oraibi, and San Francisco Mountain districts of northern Arizona and extending as far as the Virgen River in southwestern Utah. The only significant difference between these sherds and those from farther east is that the former were painted with a carbon paint while an iron paint was generally used on the latter.

In addition, Watson Smith, who has recently completed preparing for the press, in collaboration with Ralph Beals and George W. Brainerd, a report of pottery excavated by the Rainbow Bridge-Monument Valley Expedition in Marsh Pass and other regions near Kayenta, Arizona,²⁵ has assured me that many of the Pueblo II sherds from Alkali Ridge are similar in design to those found in Arizona by that expedition. Brainerd and Smith have kindly permitted me to compare pictures of their sherds with the sherds from

¹⁷ Martin and Rinaldo, 1939.

¹⁸ Morris, 1939.

¹⁹ Martin and Rinaldo, 1939.

²⁰ Kidder, 1924.

²¹ Martin, Roys, *et al.*, 1936, pp. 110-12.

²² Martin, Lloyd, and Spoehr, 1938, p. 268.

²³ Hawley, 1936, p. 46.

²⁴ Colton and Hargrave, 1937, pp. 209-11.

²⁵ Beals, Brainerd, and Smith, 1945.

Utah and, once again, I can see little distinction in the style.

We are accustomed to general similarity in design styles from widely separated regions in the Southwest, but this is more than a general similarity, it is a similarity in small details and in combinations of individual elements in the designs. And the regions with which we are dealing are not widely separated, but contiguous.

Within the practices of taxonomy we are here faced with the disagreement between the "lumpers" and the "splitters." The broad extent of this general style, with local specializations apparently developing out of it, is of immense historical significance to us. However, in the intensive studies of local prehistory now going on, it would be convenient if this broad extent could be broken down, as the probability is great that local differences do exist. With the exception of the distinction in paint composition, previously mentioned, however, these differences do not appear in the published definitions of the types listed.

I believe the solution here lies in studies of percentage variations in local use of the many design elements of which the group is composed. Although the single elements seem to be universally present, it is probable that some of them were more popular than others in any given area. For example, designs involving cross-hatching seem to be more popular in the Mesa Verde area than in other parts of the San Juan. Before classification can be done on this basis effectively, however, the designs must be defined much more carefully than they have been to date.

Even then, more work will be necessary to correlate those variations with other cultural traits. We should be able to establish local divisions by combining preferences in the use of design elements, expressed by percentages, with local variations in fashions in architecture and other traits. This can not be done by surface surveys. It can only come from more excavation in Pueblo II sites.

This long preamble should demonstrate the difficulty in assigning a geographical range for a Mancos Focus. The pottery seems to have a very wide range; the spread of architectural and other types is unknown.

DISTRIBUTION IN TIME. No tree-ring dates. Gladwin, in his phase chart, assigns 2 centuries to the Mancos Mesa Phase, 900 to 1100 A.D.²⁶ Some workers in the field at present feel that the period was of shorter duration, but the findings at Lowry Pueblo do not support this.

EXCAVATED SITES. Part of Lowry Pueblo,²⁷ numerous sites excavated by Morris in the La Plata country,²⁸ and Sites 2, 3, 5, 7, 8, 9, 11, 12, and part of

13 in this report. Certain excavated sites in Chaco Canyon and in northeastern Arizona might be included in this focus depending on the agreement reached in regard to the geographical difficulty presented above.

UNEXCAVATED SITES. Legion.

FOCUS DETERMINANTS

POTTERY. Mancos Black-on-white and/or Escavada Black-on-white, etc.; gray corrugated ware, with both all-over and partial corrugation, including Roberts' "exuberant corrugated" and various combinations of corrugation with punctate and incised line techniques; small quantities of Tusayan Polychrome, Tusayan Black-on-red, and other black-on-reds; small amount of gray ware made inside baskets; some experimentation, apparently never accepted as a general style, with polychromes based on the Mancos Black-on-white.

ARCHITECTURE. See Mancos Mesa Phase, above.

STONE. Side-notched arrow-points. (fig. 172, middle row). Axes similar to Abajo Focus, perhaps slightly cruder, much smaller percentage of notched river-pebble axes. Metates "troughed" and "flat." The troughed metates were finished by pecking about the edge, not the case with the metates of the Abajo Focus, and were open at one or both ends. Flat metates were found installed in meal bins (p. 147, fig. 24). Manos were longer than in the Abajo Focus and were sometimes triangular in cross section. Implements occurring in Mancos sites and not found in sites of the Abajo Focus were: side-notched arrow-points, tchamahias, or "skinning knives"; "sandle forms";²⁹ and chipped-stone flakes with serrated edges. Other implements similar to those found in the Abajo Focus, above.

BONE AND ANTLER. "Fleshers" or scrapers made from the humerus of the deer superseded the chisel-like end-scrapers of the Abajo Focus. Bone awls of all 5 Kidder types found, but with a higher percentage than in the Abajo Focus of the types in which the head (condyle) was either partially or wholly worked down. Very long awls, 15 centimeters, or over, were more scarce. Other bone objects were the same as in the Abajo Focus, above.

METAL. None found.

SHELL. Scarce. *Olivella* beads and fragments of *glycemeris*.

WOOD, LEATHER, AND FIBER. Unknown.

FOODS. Similar to those of the Abajo Focus with the addition of turkey.

DOMESTIC ANIMALS. Dog. Turkey bones found in the sites and the Turkey is presumed to have been domesticated on the basis of finds elsewhere.

DISPOSAL OF DEAD. Burial in refuse mounds. Burials

²⁶ Gladwin, 1934.

²⁷ Martin, Roys, et al., 1936.

²⁸ Morris, 1939.

²⁹ Morris, 1939, p. 131-32; Kidder and Guernsey, 1919, pp. 105-06.

both flexed and extended, with flexed by far the most common.

PHYSICAL TYPE. Plateau Type (see quotation from Seltzer on p. 71 in this report). Skulls usually very much deformed.

AUTHORITIES. Morris,⁸⁰ Martin,⁸¹ and this report.

Foci could also be made up to correspond with the

⁸⁰ Morris, 1939.

McElmo and Montezuma (Classic Mesa Verde) Pueblo III phases of the Gila Pueblo System. However, in the absence of tree-ring dates for the small houses, of stratigraphic excavation in the large Pueblos, and of general agreement as to what should be called McElmo and what should be called Mesa Verde, it seems unwise to attempt it. We have sufficient trouble for the present with the Abajo and the Mancos.

⁸¹ Martin, Roys, *et al.*, 1936; Martin, Lloyd, and Spoehr, 1938; and Martin and Rinaldo, 1939.

FIELD METHODS

There is a widespread popular delusion . . . that the debris which an excavator undertakes to remove from the sites . . . overlies them in even horizontal strata which can be peeled off like the layers of an onion.

— BADÉ

I BELIEVE that, as an aid to evaluating results, the reader should always be provided with a description of the methods used during an archaeological investigation. Consequently, the next few pages will be devoted to a short account of the general procedure followed by the Peabody Museum Southeastern Utah Expedition. Should any reader wish a more detailed description of a specific point than he finds herein, I shall be happy to provide such information as I can in answer to a personal communication.

The basic scheme at the beginning, as stated elsewhere in the report, was to locate and excavate sites which might provide materials in stratigraphic relationship to elucidate the enigmatic Pueblo II of the Pecos Conference Classification. Sites of this kind were soon found showing considerable change in ceramic and architectural type within a seemingly short period of time. Some of the architectural features were new and unexpected. After a few stratigraphic sites were excavated, the expedition began a search for simple sites wherein the various stratigraphic components of the more complicated sites might be encountered in isolation. These also were found and served as controls for the association of house types with artifact types in the stratified sites. Finally, Site 13 was discovered and the last season was devoted to investigation of Basket Maker III-Pueblo I problems not envisaged in the original plan.

PERSONNEL

The excavations of the Peabody Museum Southeastern Utah Expedition were carried on with a small staff and crew. During the first season (1931), the personnel consisted of the director, the assistant director, 2 laborers, and the cook. A technical assistant and one more laborer were added at the beginning of the second season, and the number was augmented

in July and August by a student from Harvard University. For the last 6 weeks of the final season the number of laborers was increased to 8 and a team of horses was added. The men were at all times under the direct supervision of the assistant director, Mr. J. A. Lancaster, and, because most of the analytical work was done at the Museum between seasons, both the director and his technical assistant thus were able to be present at the excavations most of the time.

The technical assistant had charge of mapping and photography. His primary job was the mapping, which was done with a Brunton compass and steel tapes. The value of a trained map-maker, whether topographer, architect, or engineer cannot be overemphasized. Except on the smallest operations, the mapping, if adequately done, constitutes a full-time job. Mr. Stevens, the technical assistant to the Southeastern Utah Expedition, produced finished drawings and blueprints in the field.

The assistant director supervised the work of the crew, took charge in many instances of the excavation of delicate objects, and assumed complete charge of the expedition during the absence of the director. The success of any archaeological expedition is due in large measure to the man filling this position. Mr. Lancaster combined sound archaeological technique with exceptional ability in directing workmen. He had previously worked for many years in Mesa Verde National Park and with Chicago Natural History Museum expeditions in Southwestern Colorado.

The crew consisted of local men, mostly farmers, from southeastern Utah and southwestern Colorado. With such a small number, it was essential that they should all be skilled excavators. No man was kept on unless he showed promise of proficiency in the delicate hand-work as well as strength and diligence with the shovel. Our experiences on Alkali

Ridge demonstrated the fact that farmers, familiar with the local soils, make admirable excavators if they can be interested in the work. They notice immediately anything unnatural in the soil and may be helpful, as well, in locating likely sources of types of stone, minerals, and other raw materials used by the prehistoric people. They are also often invaluable in reconnaissance, quick to see the discoloration of the surface which marks the ancient site, and trained by their own experience in locating corner stakes of the United States Land Office Survey.

At the beginning the members of the crew were instructed in technique by the director and the assistant director. For the most part, the trained men stayed with the expedition through the 3 seasons. When it was necessary to add a number of new men midway in the 1933 season, they were put on 2 at a time and assigned to work in rooms side by side with trained men of at least 2 seasons' experience. At the end of a week it was quite apparent whether the new man would be satisfactory or not.

The problems of camp management were not great with such a small establishment. The men all lived in camp, going home for weekends. Camp 1 (fig. 83) occupied during the 1931 season and the first half of 1932, was entirely in tents, with an outdoor oven built of stones from fallen walls at Site 1. At Camp 2, by Black's Spring, the expedition had the use of a small 1-room frame house with cookstove. The house served as kitchen, dining room, and living room, and, as formerly, the men slept in tents. Supplies were brought in once a week from Utah and Colorado towns and from local farms and ranches.

EXCAVATION PROCEDURE

Excavation procedure varied, of course, between the different sites. With the exception of Site 13, however, general similarity in ground plan permitted greater standardization of the method of attack than is usually possible. A site was first cleared of vegetation. On most of the sites dug the cover was sagebrush which was pulled up with the aid of an instrument called a "grubbing-hoe," piled in the kiva depression, and burned. Unfortu-

nately, the sagebrush was not thick enough to burn standing. When the outline of rooms was visible on the surface, excavations of house and kiva were sometimes carried on simultaneously. Usually, however, the kiva was dug first.

In all the excavations stratigraphic technique was used. The stratigraphic units varied with the nature of the fill or building. Natural strata and metrical strata of various depths were used as local conditions indicated. Very fortunately definite stratigraphic relationship of actual buildings was encountered in 4 of the 13 sites: Sites 2, 7, 11, and 13.

Although earlier pit houses on Alkali Ridge were filled to the surface of the ground, depressions marked the site of the pueblo subterranean rooms, called kivas. In general, the depression was less marked in the Pueblo II than in the Pueblo III sites, but it was found in some degree in all cases except for the kiva at Site 7, where there was none. The procedure generally followed was to start with a trench, 2 meters wide, across the depression in a north-south direction. An attempt was always made to estimate the center of the kiva, so that this trench would uncover the characteristic features along the center line. As soon as the upper walls, pilasters, and banquette appeared in the trench, further decision as to procedure had to be made.

In all, 15 kivas were dug on Alkali Ridge, of which 5 were cleared completely, 7 slightly more than half cleared, and 3 merely trenched. It is fortunate, for the sake of economy, that kivas often need not be cleared completely. Their predecessor, the pit house, had interesting and varying features in all parts of it. With the later kivas, however, all the floor features were almost always found in the north-south center line. A trench here also revealed the southern recess and the ventilator. If, in addition, the whole of 1 side was cleared, sufficient information was usually to be gained about the pilaster and bench arrangement. Consequently, when the southern recess had been located in the preliminary trench, a roughly semicircular area was laid out which was designed to reveal slightly more than half the kiva, including the ventilator, deflector, firepit, and sipapu in the center. If, at any time during the excavation, features appeared which suggested the advisa-

bility of clearing the whole kiva, this was done.

In addition to the kivas, 18 other subterranean or semisubterranean structures were excavated: 14 pit houses at Site 13; 1 pit house at Site 7, a large bell-shaped cist and a small subterranean room at Site 5, and a small subterranean room at Site 12. With the exception of 2 pit houses, all of these were completely cleared. The technique of partial excavation described above as generally satisfactory for kivas is inadequate for pit houses. The pit houses were less standardized than the later kivas; they usually had a much larger number of architectural features; and for the most part contained more furnishings in the form of tools and utensils upon excavation.

The material with which subterranean buildings were filled varied greatly, not only in different kivas and pit houses but often in different levels of the fill in a single building. Many were burned or abandoned with the roofs still intact. In such cases, remains of the roof material were usually found above the floor, on top of whatever was inside the room when the roof collapsed. Sometimes, in the upper part of the roof debris, articles were found which had been on top of the roof as it fell. The explanation of this is as follows. Apparently in olden times, as now, the actual life of the inhabitants was spent chiefly out of doors. Even the domestic chores of the women, the making of pottery and grinding of corn, were carried on in the open, on the roof of the house or in the little plaza in front of it, just as they are today in the Pueblo villages of Arizona and New Mexico. Consequently, we often came upon vessels and implements immediately above or in the upper part of the remains of the fallen roof. In the house units the material so found may be assumed to have been lying on the roof at the time of collapse, except in the case of multi-storied buildings, of course, when objects in such position will have come from the floor of the room above. In the kivas and pit houses these objects are from the roof. Here also we see the value to the archaeologist of ancient destructive fires which, in charred timbers and hard-baked chunks of adobe plaster, preserve the roof sufficiently for this deduction. Destruction of buildings by fire, great calamity as it was to the inhabitants, is in many ways a boon to the

archaeologist. Textile and vegetable materials which would otherwise have decayed are preserved in charred form. Remains of objects which would have been carried off, had the house been abandoned by choice, are found. The very floor and walls are often better preserved, the fire having baked the adobe to an enduring hardness. After a fire in an early Pueblo storage room the necessary labor of clearing out the debris seemed hardly worth while to the owner. Both the corn and the vessels containing it were of no further use, however important they may now appear to the investigator. Thus the room was left for the future and often then or at some later time leveled off for the erection of a new building, thereby providing stratigraphic record as well.

Roof debris in itself was very important. It was occasionally possible from the charred remains of logs, poles, twigs, and brush to obtain evidence of the nature of the roof construction. Roof remains were carefully cleared, recorded, and photographed before being removed. Such roofs were also a veritable quarry of tree-ring material, although on Alkali Ridge they were unfortunately largely of juniper, a wood seldom dated satisfactorily at present. The advantage of roofs for dating is that the remains of a large number of different logs usually occur, and, if these were cut especially for that particular roof, they will all date within a year or so of each other, thereby giving the most conclusive sort of tree-ring evidence. For this reason a sample was taken of *each log* in a kiva or in any other roof. The usefulness of tree-ring dates is directly proportional to their number for any given structure. Further discussion of tree-ring dating on Alkali Ridge will be found on pages 89-91.

The depressions of subterranean structures after they had been abandoned obviously provided admirable catch-basins for all sorts of refuse. Above the fallen roofs the filling material was variable, and we found that a careful analysis of this variability presented important indications of the nature of subsequent use of the immediate vicinity of the abandoned building. Four types of records of the gradual filling of pit houses and kivas were observed at Site 13 on Alkali Ridge.

- 1) In many cases occupational refuse of the same kind as that in a refuse mound was found

directly above the fallen roof adobe and timbers. When the potsherds and other artifacts in such refuse were typologically similar to those on the floor of the structure, we were in the possession of very good evidence of unbroken occupation of the site after that particular building had been destroyed.

2) If, on the other hand, the fill above the roof debris was of blow-sand and material washed in from the sides of the depression, we had evidence of simultaneous abandonment of the building and the vicinity. In such cases a little cultural material was usually found in the fill, washed in from the surrounding ground level, but much less than in deposited refuse and lacking the ash content. Both of these were simple kinds of fill.

3) In some of the pit houses at Site 13 a combination type was found. Immediately over the roof debris was natural blow-sand and wash fill but above this was refuse material in which the contained potsherds were typologically quite different from those on the floor of the building. This evidence indicated an abandonment of the vicinity roughly synchronous with the disuse of the house and a subsequent re-use of the immediate neighborhood at a later time by people making a different kind of pottery.

4) In the fill of Kiva 1 at Site 13 a marked change in the pottery occurred without any other noticeable break in the nature of the fill. This was evidence of change in pottery fashion with the passing of time during continuous occupation of the vicinity.

All of the above applies to gradual filling of the depression. Under certain circumstances the filling was more rapid, particularly if there was need for the space occupied by the ruined pit house or kiva. When such a depression had been filled purposely, so to speak, that is, faster than by normal accumulation of refuse, this fact was sometimes reflected in the nature of the fill. A large number of disused building stones may be an indication of rapid filling. Another indication is the presence of debris from excavations for new subterranean structures. On the northern San Juan mesas, where

the below-ground buildings are so often cut down into the bedrock, such excavation debris may sometimes be identified readily as in the case of Pit House M at Site 13 on Alkali Ridge.¹ Two reasons for rapid filling of this kind are (1) the desire to build an above-ground structure on the site; (2) the necessity of filling an inconvenient gaping hole in front of a house or in an important plaza.

These processes may be seen operating today in the modern pueblo towns of New Mexico and Arizona. From 1935 through 1939 I watched the filling of various abandoned kivas and houses in the Hopi towns on First and Second Mesas. The filling of some of them went on throughout the entire period. Others were filled up or pulled down upon my return from a winter in the East, while on the site a new building was under construction or a new car was being garaged.²

Surface houses on Alkali Ridge varied more than the subterranean houses, yet the basic technique of excavation could be standardized almost as completely. Simply stated, it was as follows: (1) if the wall outlines of a room could be seen on the surface, excavation was begun inside this room and work progressed from it to adjacent rooms until the entire house was cleared; (2) if no room outline could be seen on the surface, an exploratory trench was started at a point believed to be beyond the limits of the house. This was carried into the house mound or, since mounds were not always present, in the direction in which the house was thought to be. When a wall was encountered the procedure became the same as in (1).

Surface indications of house sites on Alkali Ridge ranged from mounds 3 to 5 meters high in Classic Mesa Verde Pueblo III sites to groups of small stones, potsherds, and slight discoloration of the earth without appreciable change in surface contours. The latter usually were the sites of early houses, but the absence of a mound is not necessarily indicative of great age. At Sites 3³ and 6⁴ on Alkali Ridge where no mounds occurred excavation eventually revealed the ground plan of houses with coursed-masonry walls. The explanation of this phe-

reports of the Peabody Museum Awatovi Expedition.

¹ See p. 187.

² Observations of "archaeological processes" at work in the Hopi towns will appear in the forthcoming

³ See p. 118.

⁴ See p. 129.

nomenon probably lay in the proximity of large pueblos to which the wall stones had been removed. This so-called "robbing" of ruined or abandoned sites of their building stones was very common, apparently, in the Southwest. It was, indeed, often the cheapest way to obtain the materials for a building. Obviously, the saving in labor was great for many arduous processes were thereby avoided including the quarrying of the blocks from the rimrock and subsequent trimming and shaping. Often the actual haul was shorter, so prevalent are the small house ruins in the San Juan.

The most difficult houses to locate were the jacals in which the main structural elements in the walls were upright posts sunk into the ground. Examples of such walls were found at many of the sites.⁵ At Site 9 all of the rooms were of this type as were all but two of the rooms at Site 12. Again the procedure under (2) above was found to be the most practical. An exploratory trench was dug from the outside into the area of potsherds and discolored earth suspected of marking a house site. When the first wall was encountered it was followed in each direction until corners were found; then the floor was cleared, and adjacent rooms were excavated as in (1) above.

The nature of the remains of the jacal walls made the location of them much more difficult than in the case of stone walls. When the house had burned, the charred stubs of posts remained in their holes and were relatively easy for careful excavators to locate. When the house, or part of it, had not burned, as was sometimes the case, such definite remains of the posts were not found. All that remained in such cases were the holes in which the posts had been set, containing a small amount of brown powdery substance, all that was left of the decayed post. Careful scraping of the old floor level with a trowel revealed these holes as small discolored "circles." The fact that the posts were quite small, usually ranging from 3 to 8 centimeters in diameter, added to the difficulty in locating them. As each hole was found a small stake was inserted as a marker (see fig. 88, *d*). In a few cases, as for example at Site 13 and in 1 wall of Room B at Site 9, some of the adobe superstructure remained

in situ. When the room had burned, this adobe was almost as easy to locate as a stone wall.

After the walls were located, excavation of rooms was usually quite simple. The floor was cleared and firepits, bins, and other features cleaned out. Then, after mapping and photographing, a test pit was dug through the floor to see if anything existed beneath it. If the underlying material consisted of refuse or disturbed earth, excavation was continued. If another floor or structure was found underneath, it was excavated after the upper building had been completely cleared and also recorded.

On Alkali Ridge the floors were usually quite definite, of hard-packed, often blackened, charcoal-laden earth, or adobe mud, solid and unmistakable. In a few rooms, however, this was not the case and the determination of floor level then became difficult or impossible. When the floor surface was indefinite a number of other indicators were sought. Bins and pits containing ashes provided evidence when a definite floor was absent. Pottery, whole or broken, and other artifacts were also useful. Sometimes, however, no furnishings were present to suggest the level of the floor. Lacking such concrete evidence, it was necessary to estimate the position of the floor on the basis of the bottom of the wall, the apparent outside ground level, and the color of the fill. This procedure is obviously unsatisfactory and unreliable. Fortunately, indeterminate floors were rare.

Refuse mounds were either trenched or excavated completely. In either case the digging was done in 2-meter squares, using arbitrary levels of 20 to 30 centimeters. Refuse mounds at the sites dug were so small and shallow that no serious mechanical problems were encountered. Unfortunately, a refuse mound does not get built up regularly. Haury's description and diagrams of large refuse mounds at Snaketown⁶ suggest the many variations in the process. Even in the small refuse mounds at the sites dug on Alkali Ridge the so-called "horizontal stratigraphy" was encountered. A description of this will be found on page 117 and also a simplified diagram (fig. 9).

⁵ See Sites, 2, 3, 5, 7, 9, 11, 12, 13, and pp. 191-93, 220-22.

⁶ Gladwin, Haury, Sayles, and Gladwin, 1937.

MAPPING AND RECORDING

Ground plans and cross sections were made by means of a Brunton compass and steel tape. The metric system was used in the field throughout, although scales in both English and metric systems are included on the plans published in this report. The map of the part of the mesa covered by the excavations was based on corner posts of the United States Land Office Survey. Finished drawings and blueprints of all maps and plans were made in the field. Field sheets, finished drawings, and blueprints were shipped to the museum separately, to avoid loss. In the rare cases where only 1 copy of a map existed, it was photographed before shipment and not sent off until the film had been successfully developed. Whole pots as well as certain other specimens were all photographed before shipment, as well.

Photographs were taken with 2 9- by 12-centimeter Voigtländer view cameras, a 3 1/4- by 4 1/4-inch Graflex, and a 5- by 7-inch Zeiss view camera. Film packs were used and the individual exposures were recorded on Peabody Museum photograph cards. Many of the pictures of Site 13 were taken from trees with the Graflex camera. The extent of the forest cover rendered a large tripod or elevated platform unnecessary.

Notes and sketches were made in uniform 100-page notebooks with pages approximately 12 by 18 centimeters of cross section paper.

Specimens were placed in cloth bags with a linen tag tied on the outside of the bag and another placed inside. Because of the small staff only such study of specimens as was necessary for intelligent planning of excavations was made in the field. Measurements, detailed analyses, etc., were made subsequently in the museum laboratories. *All specimens* were sent to the museum with the exception of some of the stone manos and most of the stone metates. The stone implements not shipped were measured and photographed in the field. The manos and metates left behind at Site 13 were reburied in Pit Houses D and G when they were refilled. Such specimens as seemed too fragile for safe shipment were treated in the field, usually with ambroid. This treatment was merely a first-aid to prepare the specimens for the trip to the museum, where permanent treatment was provided subsequently. Charcoal tree-ring specimens were impregnated with a saturated solution of paraffin in gasoline, a procedure recommended at the time by dendrochronologists. Now, most of them prefer to receive untreated specimens and suggest that fragile charcoal pieces be carefully wrapped in cotton batting and securely tied with string.

INTRODUCTION TO THE DESCRIPTION OF SITES AND ARTIFACTS, EXPLAINING CERTAIN ASSUMPTIONS AND CONVENTIONS USED IN THE TEXT AND ON THE PLANS

IN THE excavations on Alkali Ridge the common stratigraphic assumptions of archaeology have been used. Floors or buildings found directly beneath other floors or buildings are assumed to have been older than the superposed construction. Differences in absolute level, without superposition, have not, however, been considered necessarily to give the same implication. For example, the floor of Stone House A at Site 11 was at a lower level than the top of the accumulated debris of burned post-and-adobe houses adjacent to it (see p. 140); and the floor of the kiva at Site 7 was well below the floor of the pit house at that site (see p. 134). In the former case the floor of a later structure had been laid in an excavation made in the ruin of a previous structure; in the latter case the excavation for the kiva had been cut down through the floor of the pit house.

Another common archaeological assumption used is that of "cross dating" or cross checking. If certain architectural styles and ceramic styles were found in direct stratigraphic relationship at a given site, and then the styles of the upper stratigraphic layer were found at a second site and the styles of the lower stratigraphic layer at a third site, the third site was assumed to be older than the second site.

In the description of architectural features and of characteristics of utensils, I have, insofar as seemed practical, presented them in developmental sequence, as observed, without dividing them into categories in terms of current Southwestern taxonomy. At the end, however, of the description of each of the first 12 sites and of each pit house and domiciliary unit at Site 13 I have attempted to fit the findings into the 3 most prominent systems, the Pecos Classification, the Gila Pueblo Phase System, and the Museum of Northern Arizona adaptation

of the Gila Pueblo System. In the main parts of the descriptive sections whenever taxonomic classification of cultures has been used it is that of the Pecos System. In such cases period names have been assigned on the basis of pottery and architecture, with the pottery weighted somewhat. The Pueblo II period was found useful with a new definition of architectural characteristics. The same statement can be made for Pueblo III. It was found impossible, however, to apply the Basket Maker III and Pueblo I period diagnostics with any degree of satisfaction, although they have been used occasionally as descriptive terms for other sites in comparisons, such as "Roberts' Basket Maker III Shabik'eshchee village."

Whenever the terms "phase" and "aspect" appear in the text, they are used in compliance with definitions given in standard dictionaries. They are used with the special meanings given them in the Gila Pueblo and Museum of Northern Arizona taxonomic systems only when capitalized or accompanied by geographical names employed in those systems or newly suggested for them in this report. I find myself in agreement with Phillips¹ and Lothrop² in wishing that some of the words most useful in archaeological exposition had not been chosen as the names of categories in these systems.

I have also used current Southwestern binomial terms for potsherds,³ whenever such practice seemed desirable in order to relate my findings to those of students using those terms. This may seem, to some readers, inconsistent with many of my statements in the early sections of this report. It is consistent, however, with my previous statement that the system or systems used in a given publication should be correlated to some extent, at least, with other current systems in order that the work may be

Colton and Hargrave, 1937, and revised in Colton, 1941.

¹ Phillips, 1940.

² Lothrop, 1941.

³ "Rules" for naming pottery "types" are given in

more generally useful. Furthermore, and again consistent with my conclusions in the section entitled "Use and Abuse of Taxonomy," I have actually used all of the current systems in part and have derived certain benefits from them.

With regard to pottery design, I have made little attempt at description in the letterpress. Without a generally accepted standardized system of terminology for such designs, words written about them have little meaning. At the present stage of our studies we need illustration rather than words, and the designs and design elements found on pottery by the Peabody Museum Southeastern Utah Expedition are presented *in toto* in photographs and drawings in the accompanying line-cut and colotype figures. The small amount of written design description uses, insofar as possible, the terminology indicated in the published report of the results obtained by the pottery design questionnaires of the Clearing House for Southwestern Museums at the Denver Art Museum.⁴ This effort at standardization is not as yet completed and it does not include all design elements, however, it presents names for most of the common elements favored by a majority of the 31 active Southwestern archaeologists who have been circularized by the Clearing House.

Along with the architectural descriptions, scale drawings of the buildings uncovered are presented. Measurements of features which are shown on the drawings are not included in the text. It seems to me that such duplication of measurements is not only unnecessary but actually detrimental because of the hindrance it introduces to the reading of the text. It is expected that the reader will go to the maps and plans for this information if he wishes it. Only those measurements which are not shown on the scale drawings are included in the letterpress. Similarly, scale and directional indicators are for the most part not present in the photographs of structural features. I believe that the scale drawings sufficiently take care of size and direction in this connection. In my later work in the Jeddito Valley in Arizona I have followed the practice of Dr. Hugh O'Neill Hencken, Curator of European

Archaeology in the Peabody Museum, of using human figures for scale in photographs of structures. This gives the reader a clearer immediate visual conception of relative sizes, and, if he wishes exact size, he had much better take the measurements from the scale drawings than from photographs which are distorted by perspective and by the angle of the camera lens.

In the illustrations of whole pottery vessels, the measurements of 1 vessel on each figure are given. All of the vessels shown on a single figure are photographed to 1 scale. Only 2 scales were used, altogether, in the photographs of whole pottery vessels, one for medium and small sizes and another, in order to save space, for the large jars. In the illustrations of potsherds and of stone and bone objects, measurement of 1 specimen is given for scale. The proveniences of all artifacts shown in the colotype figures are given in the captions. All of the whole and restored pottery vessels found are illustrated except some of the many undecorated plain gray vessels from Site 13. All distinctive shapes of the latter are shown, however, and examples of size range within the shape classifications.

The sites were designated according to the system proposed by Mrs. Gladwin and in general use throughout the Southwest.⁵ This is based on the topographical maps of the United States Geological Survey. The designation Ab 7:11 means the eleventh site in division seven of the Abajo Sheet of the Geological Survey. All of the sites dug were in division Ab 7 and, therefore, except in the titles of the sections describing the individual sites, this prefix has usually been dropped.

Certain specialized terms or restricted uses of terms are to be found, although a conscious effort was made to eliminate special terminology except where it seemed necessary to make the meaning clear. Names in general use, derived from modern Pueblo languages, for distinctive features of Pueblo architecture are defined in the text. The most common of these terms, "kiva," for ceremonial chambers, is discussed on page 203; and "sipapu," for the hole north of the firepit in kiva floors, is defined on page 211.

⁴ Douglas and Raynolds, 1941.

⁵ Gladwin, 1928.

The term "banquette," which has been commonly used to describe the bench encircling a kiva, is little used in this report. Following Roberts, I have an increasing tendency to use the English term "bench" for this feature.

"Fill" is used for the debris found in buildings upon excavation. Cultural material found *in situ* on a floor is assumed to have been contemporaneous with the last use of that floor.

In the descriptions of sites and buildings a definite order of presentation of features, set off by headings and subheadings, has been adopted.

The sites are presented in numerical order, as excavated, followed by sections describing the development of various features of architecture and "minor" arts and crafts as shown in the excavations and in correlation with the work of other students in the San Juan.

In concluding this introduction, I wish to state that discrepancies and omissions will be found in the descriptions which follow. I deplore this fact but do not apologize for it. An apology will be of no use to students who can not find information they are seeking. I have learned certain faults in my technique from writing this report, and the only recompense can be in the avoidance of those faults in future work. Other faults of which I am not at present conscious will, I imagine, be pointed out by some of my readers. I shall welcome such criticism.

A. V. Kidder has said that as soon as field work is completed one begins to discover things which should have been done but were not. One of the most glaring omissions in the Alkali Ridge work is that we did not, in many cases, dissect the wall corners to study the methods by which the walls were joined. By this omission we not only lost specific technical knowledge but we also neglected to obtain information as to the order in which rooms were built which was probably available to us.

That this omission is a common one in Southwestern archaeology does not excuse it, and my technique has been rectified in this respect in more recent work.

I have already mentioned differences between actual archaeological practice and public statements by archaeologists about that practice. There is little excuse for those particular differences because, by examining one's techniques, they can be discovered and corrected. There is another sort of difference which is more difficult to correct. That is the difference between one's ideals of procedure and one's performance. Arnold Bennett discourses at considerable length in his journal about the differences between the ideals of conduct and procedure which his mind worked out in advance of an event and the behavior of his mind when faced with the actual contingency. But the fact that some of the suggestions I have made in earlier sections of the report may not have been followed strictly in the following sections should not decrease the value of those suggestions. Peter Beckford, an eminent eighteenth-century authority on the country sport of fox hunting, wrote: "You have observed in one of your letters, that I do not always follow my own rules. I cannot deny the charge. It is easier, I believe, in every instance, to know what is right than it is to follow it; but if the rules I have given be good, what does it signify to you whether I follow them or not?"

The rules I have given are very few, but I shall attempt to follow them. The reader must remember, though, particularly with regard to my study of taxonomic difficulties in archaeology, that this report is only a beginning, and, furthermore, that many of the principles expressed in the introductory sections were worked out *as a result of* the Alkali Ridge excavations, and not before they were carried out.

THE SITES EXCAVATED

THE 13 sites excavated on Alkali Ridge will now be described in numerical order, as excavated. In these descriptions I have tried to give a clear general picture of our finds. Considerable discussion of the significance of the finds is included also, but much of that is left for the sections on the development of kiva and house architecture and the sections describing the minor arts and crafts. These sections follow the site descriptions.

At the beginning for each site is a list of maps, plans, photographs, and illustrations of artifacts. Intended as an aid to the reader in locating quickly all illustrative material belonging to the site, it also serves to eliminate continuous reference to figures in the text. At the end for each site is a small table giving the taxonomic position of that site in terms of the most popular current systems of culture classification in the Southwest, the Pecos Classification, the Gila Pueblo Phase System, and the

Museum of Northern Arizona System. Similar lists at the beginning and end will be found in the descriptions of Pit Houses and Units of Site 13.

Throughout the site descriptions the reader will be expected to go to the scale drawings if he wishes to know actual measurements of architectural features. This has been done to protect the reader from a bombardment of figures in parentheses. Detailed description of archaeological sites is far from easy reading at best. Measurements which can not be obtained from the drawings are given in the text. In only a few cases are measurements from the plans given in the text in order to emphasize unusual features or for other special purposes.

Burials were found at Sites 1, 2, 3, 4, 5, 7, 8, 12, and 13. They are presented in standardized form immediately before the statement of taxonomic position at the end of the description of each site.

SITE 1 (ABAJO: 7:1)

MAPS AND PLANS. Figs. 5-7.

PHOTOGRAPHS. Figs. 82, *b*; 84; 85, *a*, *b*.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 114, *l*; 153, *a*; 191, *j*.

Potsherds: figs. 149, *m*; 154, *j*; 164, *c*, *f*; 166, *a-c*, *f*, *j-n*; 167, *a*, *b*, *b-j*, *l*, *n*; 168, *b*, *d*, *g*; 169, *a*, *b*, *d*, *e*, *j*; 175, *d*.

Drawings of pottery designs: figs. 68, *d*; 74, *c*; 75, *c*, *d*, *f*, *g*; 76, *b*; 77, *a-d*, *m*, *n*; 78, *c*, *g*, *i*, *k*, *m*, *n*; 79, *b*, *c*, *e*, *g*, *k*, *n*, *p*; 80, *b-d*, *p*.

Objects of stone: figs. 47, *b*; 49, *l*; 51, *e*, *f*; 175, *j*, *l*, *n*.

During the short 1931 reconnaissance, many sites were located on Alkali Ridge, and the most promising one was selected for excavation. Twelve and 8/10 miles from the main highway was the ruin of a pueblo with approximately 12 kivas (fig. 5). In common with most of the mesa-top pueblos, it extended in an east-west direction along a slight ridge, an elongated patch of sage in the forest of juniper

and pinyon. Observable architectural features and the nature of the potsherds scattered about the main building marked it for a later structure than the expedition wished to examine.

In the immediate vicinity, however, toward the edge of the sage or even within the timber growth were the remains of small units of 4 to 10 rooms with 1 or 2 kivas. Seemingly significant architectural differences appearing after close inspection indicated that these were neither built nor occupied simultaneously. That architectural simplicity and crudity are by no means conclusive criteria of comparative age in the Southwest will be adequately demonstrated in the subsequent pages of this report. But they are very valuable indicators during the preliminary surface studies, particularly when the ceramic situation is confused.

Two of the small units were investigated. At one of them, Unit 1, the buildings were completely cleared and a trench was dug through the refuse mound. At Unit 2, a

double-kiva unit, a trench was dug across the middle of 1 kiva.

Our excavations in Unit 1 and also in Unit 2 provided typological evidence that the structures were earlier than the large house. How-

ever, they did not provide us with what we were seeking. The pottery found was, with the exception of a very few apparently left-over sherds, of the kind we have classified as early Mesa Verde Pueblo III.

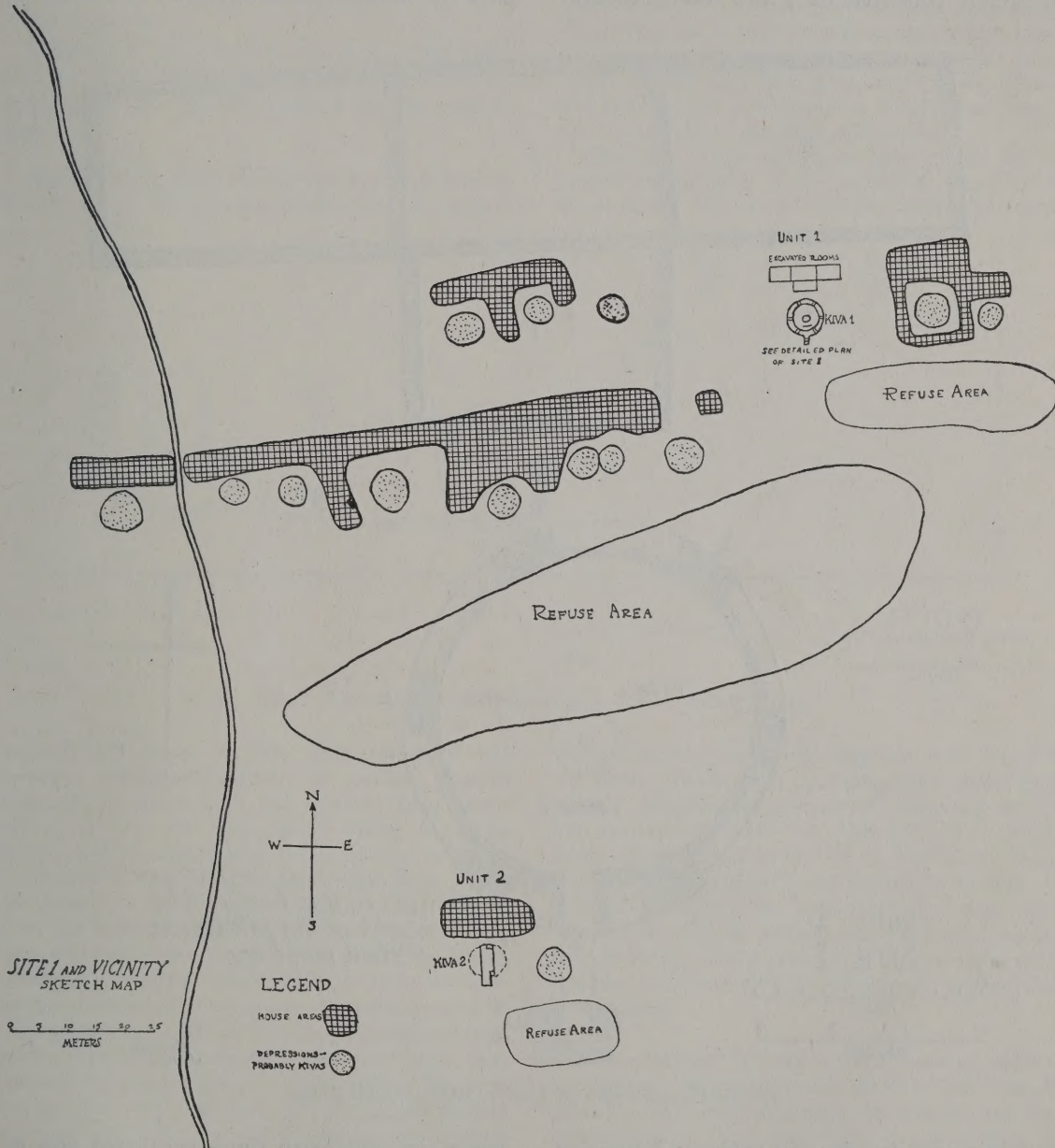


FIG. 5. Map of Site 1, Alkali Ridge, showing the large units and excavations at Units 1 and 2.

UNIT 1

The nature of one of these small units, in particular, suggested the possibility that it was built well before the nearby great house. As far as could be told from observation of the surface, it consisted of a low house mound

ible, fallen sandstone blocks scattered over the mound gave the impression that less care had been exercised in the selection and preparation of wall material than in other parts of the site. The apparent simplicity of the ground plan plus the comparative crudeness of wall stones gave rise to the expectation that this unit would

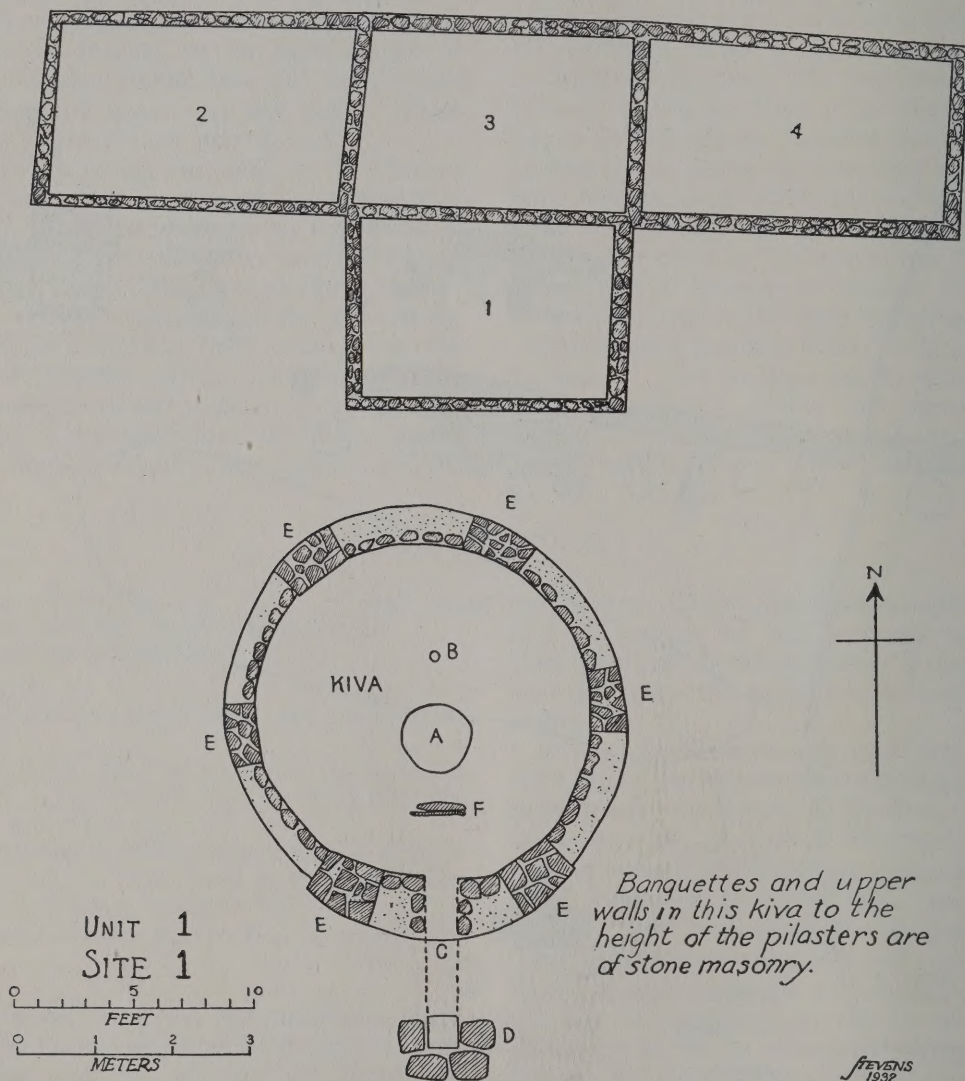


FIG. 6. Ground plan of Unit 1, Site 1, Alkali Ridge.

containing the remains of 4 rooms, a depression indicating a single kiva, and a small refuse mound to the southeast, the customary position of early Pueblo refuse mounds. Although no standing sections of the house walls were vis-

prove antecedent to those excavated and described by Prudden.

Excavation confirmed the surface deductions as to ground plan (fig. 6). The house consisted of a row of 3 adjacent rooms running

almost due east-west with a fourth room projecting southward from the central one of the three. Only slightly over 1 meter south of the front wall of the south room was the kiva, closer than usual except in those units where a passageway between the house and the kiva provides a practical reason for placing them close together.

Because of destruction by fire, apparently while it was still in use, this house was the best example of its type uncovered by the expedition.

House. All 4 rooms of the house were excavated. Except in the front room, which seemed to have

bore impressions of matted brush, it seemed probable that brush was matted down on top of the timbers, the whole then being covered with a thick coating of plaster.

The house walls were made of blocks of native sandstone. The usual dimensions of stones used in the walls were 20 by 20 by 10 centimeters, and none were found over 30 centimeters in length (fig. 85, *b*). They were laid in uneven single courses with a liberal use of spalls and were neither so carefully shaped nor so methodically laid as the stones in the pilasters and walls of the accompanying kiva nor as those in the house walls of the large ruin nearby.

Although a large amount of light-colored ash occurred on the floor in the northeast corner of the front room (Room 1) and also against the north

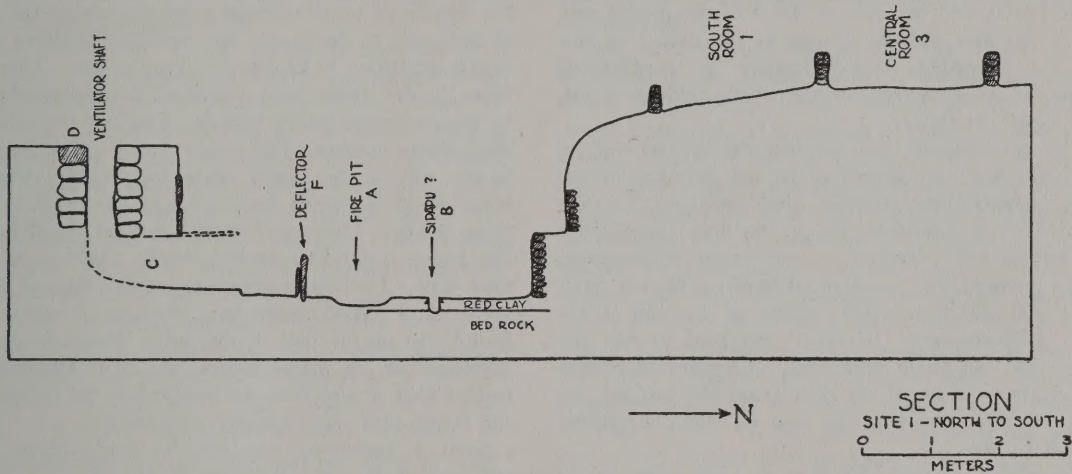


FIG. 7. Cross section through Unit 1, Site 1, Alkali Ridge.

suffered little from the fire, burned material was found 30 centimeters beneath the surface. It consisted of wood charcoal, ash, charred corn (both shelled and on the cob), baked lumps of adobe plaster, and potsherds, and continued for 20 to 30 centimeters to the floor, a total depth of 50 to 60 centimeters below the present surface. In the east room the heat generated by the burning corn had been so intense that much of the debris, including pottery, was vitrified. All 3 rooms in the main row contained corn which seemed to have been stored in piles against the walls and in large corrugated jars which were crushed beneath the roof as it fell. Charred wood and chunks of adobe plaster indicated that the roof had been made of split juniper timbers laid north-to-south upon unsplit juniper logs running east-west. The number and diameters of the latter could not be determined. Along with the charred remains of the timbers and often definitely on top of them was considerable charred brush, small sticks, etc., and, since many of the burned lumps of adobe

wall of room 4, no formal fireplaces were found in the floors, which were of hard-packed adobe mud, entirely unbroken for post or pit. Observations during excavation outside the walls indicated that the floors of the rooms were 5 to 10 centimeters below the level of the ground at the time of occupancy.

In all probability the house was of 1 story only. There is no definite evidence one way or the other, but the nature of the ground plan, the narrow walls, and the relative scarcity of fallen stones suggest such a conclusion.

Kiva. Directly in front of the house was a shallow bowl-shaped depression under which a kiva was expected to be found. Although this was the first kiva encountered by the expedition, it was decided to trench the depression and obtain some indication of the condition of the structure before planning complete excavation. In marking out the trench the nature of the depression was carefully considered in order that the trench might follow as nearly as pos-

sible the main central axis, following the principles of kiva excavation described on pages 98-99.

The upper part of the fill in the kiva depression consisted of refuse from the nearby great house and debris washed in from the house mound, including sandstone blocks, presumably from the fallen walls of the house. Despite these stones the digging was relatively easy as is usually the case in refuse material. The first evidence of the kiva encountered was the top of the northeastern pilaster. Soon the wall above the bench appeared, and upright slabs occurring in this, in place of the usual coursed masonry of the standard Mesa Verde kiva, led to the decision to clear the entire structure. The trench was abandoned and the circumference of the upper wall having been traced, excavation proceeded toward the floor.

The pilasters were found to be mounted on a well-made bench, and beneath the level of the top of this bench the first definite change in the nature of the fill was recorded. Approximately 60 centimeters above the floor charred remains of the timbers of the roof began to appear.

This encouraging evidence that the kiva as well as the house had been destroyed by fire gave rise to the hope, subsequently realized, that here too furnishings would be found *in situ* on the floor. Fragments of charred logs averaged 16 centimeters in diameter, and a considerable mass of charred sagebrush gave additional indication of the nature of the roof structure. Unfortunately, however, the roof in this instance had not fallen sufficiently of a piece to permit the reconstruction of its plan from the burned remains as was sometimes the case in later excavations (see Kiva, Site 2).

Completely cleared, the kiva of Unit 1 was a remarkable example of the regularity and standardization of the San Juan kiva (fig. 85, *a*). A comparison of the ground plan of this kiva (fig. 6) with those figured by Kidder,¹ Morley,² Fewkes,³ and Prudden⁴ clearly demonstrates the force of architectural tradition directing the construction of these buildings. The plan is characteristically simple. A circular coursed-masonry wall, coated with mud plaster, rose from the floor to a height of 89 to 96 centimeters. At this height the wall was set back to form the bench, or banquette as it is often called, on which the 6 pilasters for the support of the roof timbers were erected. Thus the bench was divided into 6 sections, the southern one, by custom, deeper than the others. The height of the pilasters upon excavation ranged from 55 to 57 centimeters. The practical identity of this measurement for all 6 and the additional fact, as shown in figure 85, *a*, that the top of the rear wall coincided well with the tops of the pilasters leads one to the conclusion that the pilasters stood close to their

original height. Thus the total height of the chamber at the circumference was approximately 1.5 meters (fig. 7), which seems very low indeed until the nature of the roof is considered.

The usual roofs on pilastered kivas, where the roof has been found in place or has been reconstructed from the remains, is a cribbing of logs. These logs were usually sufficiently large in diameter to cause the roof to rise rapidly from the circumference, producing a ceiling height well in excess of that in the dwellings. Descriptions of kiva roofs and reference to published photographs and restorations will be found on page 211.

The inner wall, below the bench, formed an almost true circle. The pilasters were so accurately placed that readings of a Brunton compass in the center of the kiva showed less than 1 degree variation between the lengths of the 6 recesses in the circumference. As in the walls of the house, the structural material was native sandstone in blocks of irregular size. Most of those in the lower wall measured approximately 15 by 10 centimeters on the face and were laid in good but not perfect courses. The stones in the 2 top courses, at the rim of the bench, were appreciably thinner, many of them having less than half the thickness of those below. The upper course formed the floor of the bench, extending approximately halfway to the rear wall. The intervening space was floored with adobe mud. Mud plaster in a number of layers was found also on the face of this wall. Although it had sloughed off in many places, we may confidently assume that at the time of occupation the blocks of the lower wall were entirely concealed.

Such a statement can not be made about the pilasters. A glance at the photographs (fig. 84) shows a decided difference in the size and appearance of the pilaster blocks. They were more carefully trimmed and the large ones averaged 25 by 22 by 12 centimeters. Although it is customary to assume that these, as well as the walls, were faced with plaster, no evidence in support of such a conclusion came to light in this instance. Plaster was found on the less highly developed pilasters in certain earlier kivas, but it is possible that the superior masonry of these later piers was left uncovered as a decorative feature. Certain it is, a commentary often made before about San Juan sites, that the masonry of the kiva, culminating in the pilaster, generally excelled that of the walls of the accompanying house.

The most interesting structural feature of this kiva was the rear wall, above the bench. Although the wall was in reality continuous, for the purpose of description it is convenient to consider separately the 6 sections of it visible between the pilasters. It was to be expected that this wall would continue the char-

¹ Kidder, 1910, 1924.

² Morley, 1908.

³ Fewkes, 1909, pl. 13.

⁴ Prudden, 1918.

acter of the one beneath the bench. Except for the segment in 1 recess, this was not the case. The segments ranged from the one just mentioned, of coursed masonry, comparable in nature to that of the lower wall, to the opposite extreme of one made entirely of upright slabs (fig. 84). Of the others, one had a single large slab extending to the full height of the wall and almost half the length of the segment, while the rest of it was of the same coursed masonry as the lower wall; one had a series of smaller upright slabs along the bottom next to the bench, the upper portion above them being of coursed masonry; one was almost entirely of coursed stones with a few small slabs set in here and there; and one, the section behind the southern recess, had fallen in before excavation. The stones lying on the floor of this recess indicate, however, that here again the wall had been made of large, upright slabs.

The explanation of this variegated construction is not clear. The appearance in such a structure of upright wall slabs in the tradition of Basket Maker III and Pueblo I is an interesting and somewhat startling demonstration of the conservatism almost universally associated with ceremonial edifices. It is quite possible that at one time these 6 sections of the upper wall were entirely slab lined and that from time to time, as necessity demanded, repairs and replacements were made in the more "modern" coursed masonry. The wall when excavated curved in decidedly at the top, and the pressure inwards and downwards against it must always have been of considerable magnitude. Moreover, the slab walls were found to be the least stable on excavation. If proof were necessary, we have presented here evidence of the superior durability of coursed masonry. The slabs behind the southern recess had fallen in completely, and those of the other wholly slab-lined segment leaned forward at various angles (fig. 84). The latter have since fallen in, while the coursed-masonry sections had, when last seen, withstood 8 years' exposure to the rather rigorous elements of southeastern Utah.⁵

The structural furnishings of the floor were strictly conventional: deflector, firepit, and sipapu in traditional alignment north of the opening of the ventilator shaft.⁶ The deflector, F (fig. 6), was a crudely shaped sandstone slab only 4 centimeters thick imbedded in the floor and standing upright to a height of 69 centimeters. Adobe was packed about the base to lend stability to the installation. Averaging 50 centimeters in width, it stood between the ventilator and the firepit, a screen for the fire against direct draft from the outside. Leaning against the deflector

on the south side was a large fragment of a much more carefully worked slab which presumably served as a shutter to close the ventilator opening.

The ventilator shaft, C, extended back horizontally from the kiva wall until it joined a vertical shaft running up to ground level. The opening in the kiva wall was 45 centimeters wide, rectangular, with carefully built corners. Because of the collapse of the roof, which was also part of the floor of the southern recess, the height of the opening could not be measured, but it must have been approximately 80 centimeters, that is, almost as high as the bench. The cause of this slight difference in height was a stone slab sill 8 centimeters thick. Unlike earlier kivas, the sides of the shaft were stone walled throughout their length, as were those of the vertical shaft.⁷ Like the other parts of the standard kivas these walls were remarkably true.

Due north of the deflector was the firepit, A, an excavated basin in the floor. It lacked the raised adobe collar often found around firepits. When found it was full of wood ash containing a few potsherds. North of this, in the same due north-south line, was the sipapu opening. The sipapu, B, was the single completely ceremonial permanent feature of the ordinary kiva, if we follow the generally accepted custom of identifying the holes in the floors of the ancient ones with the homologous opening found in many of the kivas of the modern Hopi (see p. 211). The sipapu opening, as was often the case in the San Juan, was provided with a pottery collar. Set flush with floor level was the rim of a large, narrow-necked jar (fig. 175, *d*). Beneath the floor some of the flaring part of the jar was still attached to the neck so that a hole considerably larger than the diameter of the sipapu had been dug to permit the installation. The use of a similar irregularly fractured jar neck for the sipapu opening is reported by Prudden in his ruin no. V on Cohon Mesa east of Alkali Ridge in southwestern Colorado,⁸ by Morley at the nearby Cannonball ruins,⁹ and by others.

One other interesting characteristic of the sipapu remains to be noted. The kiva floor at this point lay 23.5 centimeters above bedrock and yet the depth of the sipapu was 29.5 centimeters. In order to procure this depth an excavation 12.5 centimeters in diameter and 6 centimeters deep had been made in the bedrock. Evidently the builder had very definite ideas as to the necessary depth of the sipapu.

Through the fortunate accident, previously alluded to, of the collapse of the roof while the building was still in use, a number of objects were found on

ings will be found on pp. 211-12.

⁷ A discussion of the development of the ventilator will be found on pp. 208-09.

⁸ Prudden, 1918, p. 11.

⁹ Morley, 1908, p. 603.

⁵ There are other instances on record of slabs in the walls of San Juan kivas. Fewkes describes a slab wall above the bench in One Clan House on Mesa Verde. Fewkes, 1923a, p. 105.

⁶ A complete discussion of kiva floors and furnish-

the floor and on the bench. Many of these are shown in position in figure 85, *a*. Two platters, one containing wood ash, were found on the bench on the northwest and southwest recesses. A third platter, broken on the floor in front of the southeast recess, may well have fallen from the bench at that point. These platters were reworked bases of large cooking or storage jars which, incapacitated by breakage for the functions they were intended to perform, were salvaged for use as plates or saucers. Other objects on the bench were a grinding-stone (*mano*), broken into 3 pieces, and a large heavy river-pebble of the type known as "floor-polishers."¹⁰ Both of these were in the southeast recess.

On the floor itself the outstanding find was a stone vessel (fig. 175, *j*) slightly to the northwest of the firepit, containing charred beans. Crushed remains of 6 pottery vessels, including a black-on-white kiva jar (fig. 191, *j*), a large corrugated jar, and another dish were scattered about mostly near the wall. At the extreme south end of the ventilator shaft was a large full-grooved axe. Popular belief in southwestern Colorado asserts that the Mesa Verdians made a practice of placing an object of value in the angle of the ventilator, as offering to some house-god or as guardian against the entry of evil spirits by this route. A simple explanation which immediately presents itself of the presence of the axe in its peculiar location is that it fell down the vertical shaft at some time not very long after the burning of the kiva and was not retrieved.

Although not on the floor or bench, one other specimen can be associated chronologically with the occupancy of the kiva. Amidst the roof debris in the fill a troughed metate, with groove open at both ends, and accompanying *mano* were discovered. These had, presumably, been on the roof when it collapsed. Consideration of the use of roofs by Pueblo Indians will be found on page 99.

Refuse Mound. The least satisfactory part of Unit 1 was the refuse mound. Immediately to the west and south of it lay the large trash area of the nearby great house, and the situation here was no different than that which obtains in large refuse heaps throughout southeastern Utah and southwestern Colorado. *Pot-hunters* have rifled these mounds for decades until in many there is hardly a square yard left unturned. Usually the small sites, not easily located or holding out little promise of great loot, have suffered relatively little from this archaeological counterpart of guerilla warfare. In this case, however, the smaller, being on the ground so to speak, had been pitted along with the larger. The number of "shell-holes" in the surface augured very ill in-

deed, but it was decided to trench in the hope of finding undisturbed sections or at least of getting a representative collection of potsherds.

The trench, 2 meters wide, ran for 8 meters, showing evidence of disturbance for almost the entire distance. The maximum depth was 40 centimeters of typical open-site refuse material with rather more than average occurrence of potsherds. A number of small or fragmentary human bones remained of burials previously removed.

Burial. One burial was found, the crushed and scattered bones of a baby, so young that none of the teeth had erupted in either jaw. No mortuary offerings accompanied the child. Although by no means the rule, many very young children are found thus. This does not mean that they were necessarily put naked into the grave but merely that they were not given objects of pottery, bone, or stone, the only materials that endure in mounds in the open. Burials of children in the dry caves usually are wrapped in cloth, skin, or matting, substances which very rarely leave a trace in the open sites.

UNIT 2

Kiva. After the excavation of Unit 1, the short 1931 season was brought to a close with a trench through one of the depressions of a double-kiva unit south of the great house. In appearance this unit was very like the one shown in figure 82, *b*. Before the ever-accumulating depth of unseasonable snow drove us off the mesa, a section 2 meters wide was cleared in the north-south line across the kiva floor. Deeper than the Unit 1 kiva by 50 centimeters, smaller in diameter, and more elaborate, it was still of the same general type which we call the standardized San Juan kiva. The masonry of the lower wall and pilasters, of which two appear in the trench, was identical in the 2 kivas. In the kiva of Unit 2, however, except in the southern recess, the wall above the bench had no masonry. When excavated it was only a smooth, curved face in the native hard-packed red earth. Presumably it had, when in use, been plaster coated and, with the stone pilasters to carry the weight of the roof, seemed to have served its purpose very well. As the report of our work on Alkali Ridge continues, it will be seen that this type of wall was very common in subterranean structures. Prudden, Kidder, Martin, and Morris all describe similar upper walls in kivas of the larger sites on the northern mesas of the San Juan.

The southern recess, stone walled on all 3 sides behind the pilasters, was much larger than that of the kiva of Unit 1. Almost 2 meters square, it exceeded

¹⁰ A description of the stone objects classified as "floor-polishers" is to be found in Kidder, 1932, pp.

all others reported from the Mesa Verde-McElmo region except that of Kiva E in the south pueblo at Cannonball ruin which seems to have been of about the same size.¹¹ The ventilator shaft, unusual too, came to the surface 5.35 meters south of the rear wall of the southern recess, making the length of the horizontal shaft more than 7 meters. No satisfactory explanation of this great length presents itself. Perhaps it was the manifestation of personal idiosyncrasy, a factor I believe to be generally underestimated in archaeological as it is overestimated in much historical work. Or perhaps some use of the first few meters immediately to the south of the kiva prohibited bringing the ventilator to the surface until beyond that area. Obviously, by extending the horizontal length of the kiva ventilator a larger unobstructed plaza in front of the house would be possible.

In its other dimensions the ventilator was normal enough. The opening into the kiva was 42 centimeters wide and reached from the floor to the bench. Although the slab forming at the same time the roof of the shaft and the floor of the southern recess at this point was still present, it had cracked and slumped so badly that a height measurement was unobtainable. At the other end, the opening of the vertical shaft at ground level was 55 centimeters square. It was not determined whether or not the ventilator unit was "built-in" in terms of the discussion to be found on pages 208-09.

Inside the kiva the tendency toward oversize continued. Its more than usual depth has already been remarked, and both the firepit and deflector were the largest discovered by the expedition. The firepit was oval, 92 centimeters east-west by 83 centimeters north-south. It was 24 centimeters deep and had neither an

adobe collar nor a slab lining. The deflector slab was 85 centimeters wide. Its original height could not be determined because of its fragmentary condition.

No hole of the type called sipapu was found. To the east of the north-south axis there was a small hole in the floor near the northeastern pilaster. However, it was very small, 5 centimeters in diameter, and there is no reason for calling it a sipapu.

In the lower wall was a traditional feature of the standard kivas which was absent in Kiva 1. Directly under the northeast pilaster, though not quite centered, was a slab-lined niche 29 centimeters wide, 25 centimeters high, and 34 centimeters deep, near the floor. These occur with great frequency in San Juan kivas, mostly in the northern segment of the wall, and often, as in this case, beneath one or the other of the northern pilasters. It is not unusual to find sealed niches, as they are called, carefully plastered over and containing sacred or cherished articles. A discussion of kiva niches will be found on page 213.

The objects found on the relatively small part of the floor cleared were a badly battered small stone axe; a crude pounding-stone; a pellet, 5 centimeters in diameter, of crude shale; fragments of 2 corrugated pots; and, in the ashes of the firepit, a broken black-on-white globular jar.

TAXONOMIC POSITION OF SITE 1

PECOS CLASSIFICATION. Pueblo III.

GILA PUEBLO SYSTEM. McElmo and Montezuma Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Undefined Mesa Verde Pueblo III Focus or Foci.

SITE 2 (ABAJO: 7: 2)

MAPS AND PLANS. Fig. 8.

PHOTOGRAPHS. Fig. 85, *c*, *d*.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: fig. 153, *b*, *g*.

Potsherds: figs. 103, *ee-bb*, *ll*; 127, *f*, *b*; 133, *g*; 137, *g*; 140, *b*; 143, *e*; 147, *e*; 151, *u-u'*; 156, *b*; 166, *d*; 167, *c*, *d*; 169, *f*.

Drawings of pottery designs: figs. 74, *b*; 75, *b*, *p*; 76, *d*; 77, *e*, *l*; 78, *f*, *j*, *p*; 79, *i*, *o*.

Objects of stone: figs. 49, *f*; 50, *d*; 170, *l*; 172, *s*; 175, *b*.

Upon returning to Alkali Ridge in May, 1932, the expedition made a rapid survey extending 6 miles north and 8 miles south of Site 1, with the object of locating sites which,

from their surface indications, gave promise of antedating the structures excavated during the first season. After a short reconnaissance, it became apparent that a number of such sites were to be found. Scattered about between the more prominent Mesa Verde sites were others with low, indistinct house mounds and very shallow kiva depressions. A careful combing of the surface often failed to discover a single Mesa Verde potsherd.

In addition to the rather high probability that they represented an earlier time in Alkali Ridge history, the new sites provided still further encouragement to the investigators. In the description of Site 1, and elsewhere, attention has been drawn to the great activity of

¹¹ Morley, 1908, pl. XXXVII.

pot-hunters in southeastern Utah and the resulting destruction of refuse mounds. In this almost continuous campaign of amateur and semiprofessional vandalism the small, insignifi-

cluded also a search for surveyors' section-markers, springs, and water-holes, and the more promising sites were ear-marked for excavation.

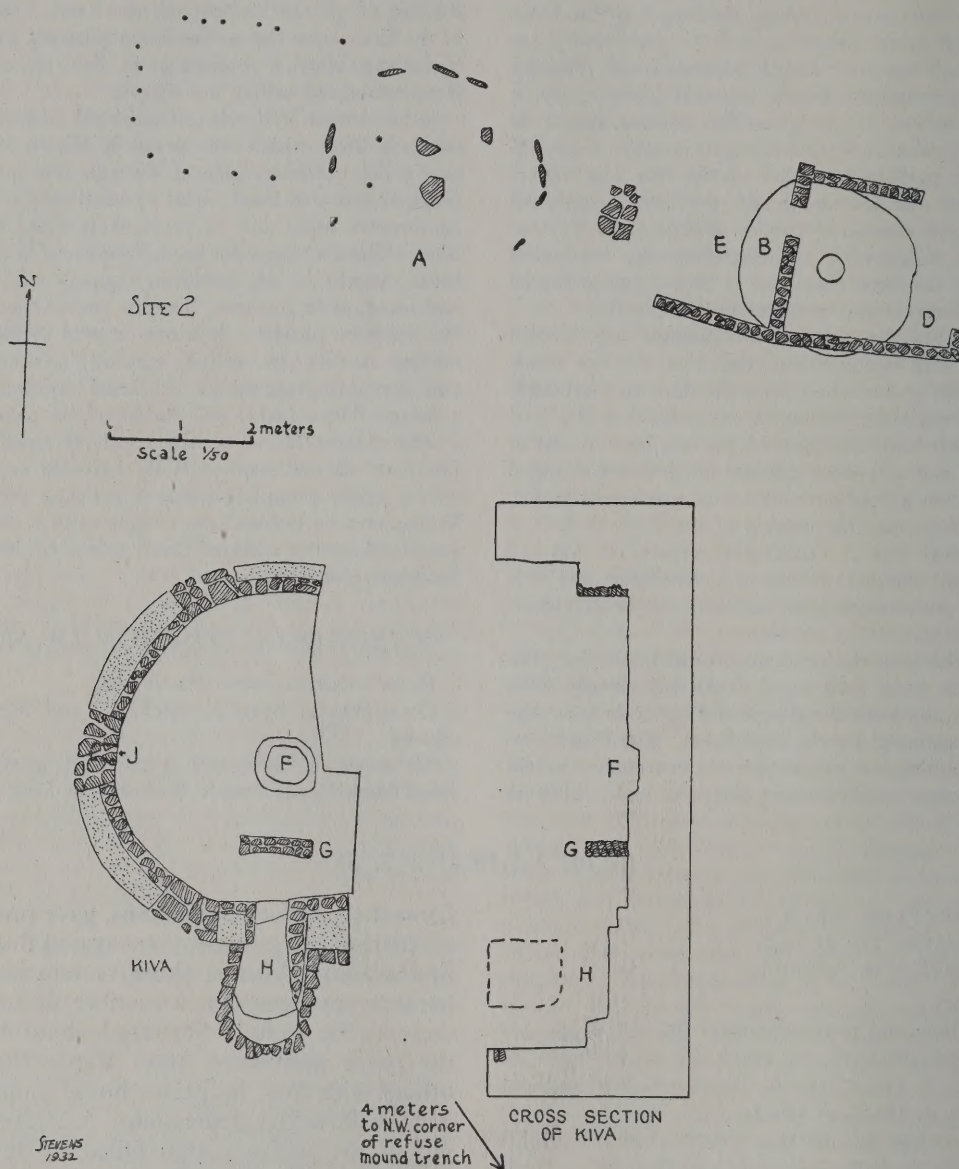


FIG. 8. Ground plan of Site 2, Alkali Ridge, and cross section through the kiva.

cant sites have in general been passed over. Thus many of those whose surface indications fulfilled the requirements of the expedition presented also apparently *undisturbed* refuse mounds. Sixty-three sites were located in the preliminary 1932 reconnaissance, which in-

Site 2 (Ab: 7: 2) was in some respects the most and in others the least satisfactory site of the second season. Here we encountered our first clear stratigraphy and also the first definite indication of cultural material earlier than Pueblo II. Near the rim of Bradford Canyon,

$\frac{1}{2}$ mile east of Site 1, architectural styles ranging from slab circles to coursed masonry, and pottery ranging from the earliest known in the region to well-developed Mesa Verde forms and designs were revealed within an area 15 meters square. For the first time we encountered upright slabs forming the base of a wall, remains of a Developmental Pueblo jacal structure, a kiva showing definite and significant variation from the general basic form of the standard San Juan type, and pottery absolutely distinct from Classic Mesa Verde wares. Above all, a large amount of Mesa Verde pottery was found.

House Area. General discoloration of the earth and a few scattered stones on the ground were all that marked the house area north of the kiva depression. With no surface indication of the size, shape, or even specific location of rooms, it was decided to throw a wide trench across from west to east in order to find the house. The trench was laid out and excavation began at each end, well outside the apparent extent of disturbance. This procedure, common in excavations in the mound area of the Middle Western states, is an insurance against missing part of the occupied area and also brings the excavator first to the *outer* wall of the unknown building. At Unit 1, Site 1, where the outlines of the house rooms were distinguishable on the surface, clearing of the insides of the rooms began immediately. But even in such cases, unless one's time is very limited, the excavator will be adequately repaid for the extra labor of starting his trench in undisturbed ground, working in toward the structure and picking up the ever interesting and often significant outlying evidences of habitation.

At the western end of the trench (see fig. 8) were found the slender remains of what eventually proved to be the last house on the site. Barely covered by the surface soil, a few of the stones actually projecting above it, were the blocks of the lowest course of a masonry wall. In some places throughout its short remaining length a block of the second course was still in place but apparently most of the wall-rock had been removed for later use, probably in a rather large great house between here and Site 1.¹²

A glance at the plan shows immediately the extent to which this borrowing went at Site 2. The bottom course of but part of the walls of 2 rooms, D and E, remains of a structure which must have reached, according to all San Juan architectural tradition, well across the space north of the kiva. Certain of the revised architectural features and the pottery found therein place the final occupation of the kiva at a time subsequent to the introduction of Mesa Verde pot-

tery, and the probability is that the coursed-masonry walls found constitute the last remaining vestige of a single-row unit, the western rooms of which extended over part, at least, of the earlier rooms shown on the plan. The blocks in this wall are heavier, more irregular in size, and more crudely shaped than those in the house of Unit 1, Site 1, but, on the other hand, they are neither so large nor so crude as those of the east room at Site 5. In this, as in many other respects, the last occupation of Site 2 seems to assume an intermediate position between Sites 1 and 5.

Work at the western end of the trench revealed a room with a radically different type of wall, later found to be characteristic of one stage in the development of the pueblo culture on Alkali Ridge, but at the time of excavation unfamiliar and unexpected. The first indication of something unusual was the discovery of the rotting remains of a small post, 8 centimeters in diameter, set upright in the ground. Twenty-five centimeters on either side was another, forming a row of 3, roughly at right angles to the direction of the trench. Further extension of the trench east and south revealed 2 other rows of posts running from east to west, and it became apparent that the remains of a wooden structure had been encountered.

Sixteen posts were found in all, 13 very definite, with the butts still in place, and 3 merely a little brownish powder in the holes in which they had been. Although the full complement of posts were not found, the outline suggested is that of a rectangular room or enclosure, *c* in figure 8. Pottery or other artifacts definitely associated with this room were not found, and explanation of its function was not immediately forthcoming. Turkey bones were present in the fill and debris of all parts of the site, and the possibility of its having been a turkey pen was considered. Its dimensions, however, are almost identical with those of the rooms of Unit 1, Site 1, and its location north of the kiva suggested strongly that it had been part of a house. The full significance of this discovery appears in connection with Sites 9, 11, and 12 and will be discussed later. Its greatest importance for the moment lies in its position in relation to the final and most surprising development in the house area.

The easternmost posts of the structure described above were driven down into the floor of an earlier building, A. The earlier floor was 50 centimeters below the present ground surface, 25 to 30 centimeters below the rather indefinite hard-packed level which seemed to be the floor of the post house. Roughly circular in form, it was 3 meters in diameter, and 9 upright sandstone slabs still marked two-thirds of the circumference. The slabs ranged in size from 27 to 41 centimeters in width, 2.5 to 11 centimeters in thickness, and projected above the floor from 20 to

¹² See pp. 100-01.

32 centimeters. Upright slabs in the base of a wall are an architectural characteristic attributed to the early days of the southwestern agricultural civilization and an accepted diagnostic of periods from Basket Maker II through Pueblo I. The early date of this circular room was confirmed by the discovery, both on and above the floor within the circle, of 3 undecorated jars and numerous sherds of the kind usually classified as Basket Maker III or Lino Gray.

Another such circle, B, was found under the coursed-masonry house at the west end (see fig. 8) 60 centimeters from the surface and 45 centimeters beneath the base of the late wall. A number of large slabs were found in the fill under the coursed walls, but none of them were found upright in place. The floor, however, was easily traced. Somewhat smaller than the first circle in diameter, slightly under 2.5 meters, it was equipped with a small pit, 35 centimeters in diameter, in the center. This may have been a firepit or perhaps the hole for a central roof-support post. Although no whole vessels were found, the potsherds on this floor were even more interesting. Immediately beneath the coursed-masonry walls Basket Maker III sherds began to appear, and for the last 20 centimeters above the circular floor no other wares were present in the fill. On the floor itself were a number of sherds, including rimsherds of a very crude small bowl, 2 globular jars, and 1 globular jar with neck, all of Basket Maker III type.

Between the circles A and B and again south of the post house were a number of slabs, in piles or on their sides, possibly the remains of other slab circles, but no further floors were found nor any more slabs upright *in situ*.

The last remaining feature of the houses to be described is a small slab pavement of 7 stones lying in a definite floor level between the slab circle A and the coursed-masonry House E. The floor, or more properly the hard-packed occupation level of which the pavement was a part, extended underneath the masonry wall of House E but overlay the floor of circle B. Thus it seemed that this fragment of pavement belonged to an occupation intermediate in time between the initial slab circles and the terminal coursed-masonry house. It will be remembered that stratigraphic evidence shows that the post house was built after the disuse of the west slab circle. Thus, meager as it is, the evidence is sufficient to permit a tentative conclusion that the post house and the level bearing the pavement may have belonged together. At least, in the time-scale, they both lay between the slab houses and the coursed-masonry unit.

Kiva. The kiva at Site 2 presented interesting variations of the San Juan standard. Most of the divergencies arose from 2 causes: (1) the closeness of bedrock to the surface at this point, and (2) the

possibility that the kiva, as last used, represented a remodeling of an earlier structure. The first thing to strike the observer accustomed to Mesa Verde kivas is that this one was far from circular (fig. 8). Not only was it flattened at the south end but it was also eccentric. A line drawn from the center of the ventilator shaft northward through the center of the firepit would intersect the north wall at a point where it was still running northeast and before the curve to the southeast, to close the "circle," began. In connection with this eccentricity the unusual construction of the ventilator region and southern recess must be considered. Full discussion of this point must be reserved for the section of the report dealing with kiva development, but attention is called here to the following possibility: that, taken in conjunction with the slab-walled circular rooms, which might well have been Basket Maker III storage rooms, found immediately to the north, the eccentricity of outline of the kiva may have arisen from the fact that it was originally a pit house; and, further, that certain characteristics of the southern end suggest that the excavation in which the vertical ventilator shaft was built may originally have been the southern antechamber of a pit house (see Site 13) or a southern recess of a type comparable to those of the early kivas of Sites 11 and 12.

However that may be, the kiva, when excavated, revealed definite attempts to conform to the San Juan standard (fig. 85, *d*). Like most of the buildings on Alkali Ridge it had been destroyed by fire, and charred remains of roof timbers 14 to 20 centimeters in diameter gave a fairly good indication of the cribbed roof resting on pilasters (fig. 85, *c*). At the top of the photograph 2 logs can be seen lying on the floor as they had fallen from the 2 northern pilasters. The pilasters were all very large. The western one, with a length of 85 centimeters at the face and 120 centimeters at the back, was the largest found on Alkali Ridge. The bench was quite irregular in width and the top was covered with adobe plaster. With the exception of the wall behind the southern recess, the upper wall consisted of plaster applied to the native earth, and the lower wall was of coursed masonry. In many places the plaster remained on the latter wall. Underneath the western pilaster was a small niche, J, 20 centimeters deep with an opening 9 by 11.5 centimeters. The floor, nowhere more than 1 meter beneath the present ground surface, consisted of adobe plaster smoothing out the irregularities of the bedrock. The roughly circular firepit, F, was cut out of bedrock and showed the remains of an adobe collar around the rim. Such a collar is common in earlier kivas and in pit houses.

A double wall of coursed masonry, G, served as a deflector, in place of the usual upright slab between firepit and ventilator opening. Such wall deflectors

are common in the kivas of the large houses on Mesa Verde proper and have been found by Prudden on Squaw Point and by Morley at Cannonball ruin in southwestern Colorado.¹³ They are not common in structures antedating the beginning of Mesa Verde pottery designs but have been reported as early as Pueblo I.¹⁴

A peculiarity was also to be observed in the southern recess in that only a small part, little wider than the horizontal ventilator shaft, extended back to the extra depth usual in standard San Juan kivas (fig. 85, *d*). In the same picture the east wall of the horizontal ventilator shaft may be seen, a combination of coursed masonry and upright slabs similar to parts of the wall above the bench in Kiva 1, Site 1. The upright section of the built-in ventilator shaft had fallen.

REFUSE MOUND. The small, shallow refuse mound, at no place more than 50 centimeters deep, was cut through from east to west by a trench 2 meters wide and 17.3 meters long. A cross trench 2.3 meters wide was dug from the first trench to the northern edge of the mound. These trenches revealed a rather inconclusive example of a common condition of refuse mounds often somewhat loosely referred to as horizontal stratigraphy. The oldest sherds were found in the end nearest the buildings. A few Basket Maker III-type sherds occurred 20 to 40 centimeters beneath the surface in the first 4 meters of the trench. On top of them and extending for 6 meters more were Pueblo II sherds, while the rest of the mound was very definitely Mesa Verde Pueblo III.

over the 16-meter mark did not contain a majority of Basket Maker III potsherds. There were more Pueblo II sherds even at that point. The shading merely marks the point where Basket Maker III sherds mainly occurred. Diagrammatic representations of this kind should be made with the same reservations and used with as much care as schematic representations of culture periods.

It seems to me that here we can come nearer to establishing a general rule, though a negative one, than is usual in archaeological work. Thus we may say that the changes, as indicated by pottery, to be observed in small, shallow refuse mounds are usually changes in percentage only, some sherds of each type being present in all parts. Occasionally an abrupt change is found in the potsherds at a given place in a mound which may or may not be accompanied by a definitely observable line of demarcation in the strata. This situation is produced only when disuse occurs, through temporary abandonment of the site or through disposal of refuse elsewhere, lasting a sufficient length of time to permit marked change in the pottery or to permit the accumulation of a blow-sand or vegetable cover over the older part of the mound. Even then some infiltration, through rodent holes and other causes, of later materials into the earlier refuse is bound to occur. Obviously under such circumstances it is the general tone rather than the individual sherd which is to be considered.

Two burials of infants were found in the refuse mound. The bones were in very poor condition, but it was possible to determine that the bodies had been tightly flexed before burial.

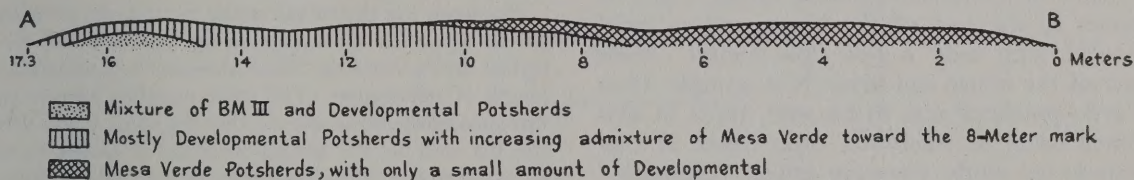


FIG. 9. Simplified schematic representation of a cross section through the refuse mound at Site 2, Alkali Ridge.

The story of the accretion of this mound is shown in simplified diagrammatic form in figure 9. Point A is nearest to the houses and, as time went on, the refuse was piled farther and farther away. The representation in the diagram is highly idealized. There was no clean-cut line of demarcation as one finds in many geological stratifications. Actually, between the 10- and 6-meter marks the weight of the percentage of sherd occurrence shifted from Pueblo II to Mesa Verde, just as the potters themselves were one by one abandoning one canon of design for the other. And the small area shaded to show Basket Maker III

BURIALS

BURIAL 1. Infant.

Under small sandstone slab.

Position: tightly flexed; this burial and Burial 2 were so fragmentary when found that the exact position of most of the bones could not be determined. The lower limbs of both bodies, however, had been tightly flexed against the torso as in figure 46, *e*.

Associated finds: black-on-white bowl inverted over burial (fig. 77, *i*; 74, *b*).

BURIAL 2. Infant.

Under small sandstone slab.

Position: tightly flexed; see Burial 1, above.

Associated finds: black-on-white cup (fig. 153, *b*).

¹³ Prudden, 1914, and Morley, 1908.

¹⁴ See Protokiva 1, Site 18, Morris, 1939, p. 60.

Taxonomic Position of Site 2

PECOS CLASSIFICATION. Basket Maker III, Pueblo II, and Pueblo III periods.

GILA PUEBLO SYSTEM. La Plata, Mancos Mesa, and McElmo Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino, Mancos, and undefined Pueblo III Mesa Verde Foci.

SITE 3 (ABAJO: 7: 3)

MAPS AND PLANS. Figs. 9-12.

PHOTOGRAPH. Fig. 83, *c*.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 111, *s*; 113, *b*, *g*; 114, *c*, *d*, *g*; 153, *d*, *f*.

Potsherds: figs. 116; 121, *f*; 122, *b*; 125, *i*, *j*, *k*; 127, *a*; 128, *d*, *e*, *g*; 129, *b*, *e*, *f*; 133, *a*; 134, *i*; 135, *d*; 136, *e*; 137, *c*, *e*; 138, *d*, *b*, *l*; 139, *f*; 140, *d*; 141, *c*, *j*, *k*, *l*; 142, *c*; 143, *f*, *q*; 147, *l*, *n*; 149, *f*, *j*; 151, *b*, *f*, *j*, *q*; 157, *e*, *b*; 158, *b*, *i*; 159; 160, *a*; 161, *a-d*, *f*, *b-k*; 162, *b*; 163, *b*.

Drawings of pottery designs: figs. 69, *e*; 70, *c*, *d*; 71, *e*; 72, *a*, *b*; 73, *d*; 74, *f*; 78, *e*.

Objects of stone: figs. 48, *b*; 51, *o*; 172, *j*.

Objects of bone: fig. 182, *c*.

ILLUSTRATIONS OF BURIALS AND SKELETAL MATERIAL.

Fig. 192, *a*.

By the side of the wagon road, 1.6 miles from Site 1, was one of the most promising sites located by the reconnaissance at the beginning of the 1932 season. The surface survey showed a single-kiva depression, rudimentary remains of a coursed-masonry house, a pile of stones to the east of the latter, and a burial mound with only a few "pot-hunter" holes east of the house and kiva. Not a single Mesa Verde potsherd was to be seen, those in evidence being of Pueblo II type which at that time in the study we were calling "Chacoan," thereby marking a differentiation from the Classic Chaco pottery, while at the same time recognizing the obvious cultural relationship.

House Area. Excavation revealed the lower courses of the walls of a 3- or 4-room house (figs. 10; 83, *c*). Never more than 2 courses remained, and in some places the stones were all missing. The condition here was similar to that of the coursed-masonry house at Site 2, and presumably the cause was similar, too. Directly to the north of the site was a prominent ruin of a double-kiva unit, the house mounds rising for several feet above the level of the mesa-top, the probable ultimate repository of the blocks which had formed the walls of Site 3. East of the main house was a rock pile almost 1 meter high. This proved to be the ruin of a single-room structure of a puzzling

nature and therefore will be considered apart from the other rooms, with which it had no apparent connection.

The main quarters north of the kiva consisted of certainly 3 and possibly 4 rooms. Although a number of pieces of charcoal were found in the soft earth fill, these rooms did not appear to have been destroyed by fire; nor was the kiva, at least not in the sense of most other Alkali sites. The fire, if there was one, was mild in its nature and the usual charred timbers, burned-adobe plaster, and crushed vessels on the floors were not in evidence. The floors themselves could not be determined with any certainty. Charcoal in soft earth continued down to 30 centimeters below the surface, 10 centimeters below the bottoms of the walls, where undisturbed red earth was encountered. A vague suggestion of a floor was observed 12 to 16 centimeters from the surface, but that was all. A wall of crude stones set off the northeast corner of Room A, possibly forming a storage bin, but aside from this no evidence of internal structure was found. There were no fireplaces nor were any ash piles or ash pits discovered. The impression gained was that this building was very little used, abandoned or destroyed perhaps not long after construction.

However, the size of the refuse mound, the revision of the sipapu in the kiva (see fig. 12), and the disturbed area around the house indicated a considerable length of occupation. The most probable answer to this apparent contradiction is that the stone house was the last one on the site, succeeding an earlier jacal structure suggested by post holes found in the vicinity of the masonry structure. For almost 15 meters west of the stone rooms occupational disturbance persisted, and a trench was dug across it, from east to west, in search of further house-structure. The only results were a few post holes in no apparent relationship to each other, in the midst of the pottery-laden debris of rather abundant occupation. Even with the precedent of Site 2 this phenomenon, or rather absence of phenomena, proved exasperating. It remained so for a month and a half, after which the solution came with the excavation of Sites 9, 11, and 12, where definite outlines of post-walled structures were found. We then returned to Site 3 and found more post holes. Although we did not succeed in tracing actual wall lines, I believe that the post houses had been there and probably provided the shelter during much of the life of the site.

The last part of the house group to be described is the foundation of a single-room structure discovered under a pile of stones east of the main house. The outline as it appears on the map (E in fig. 10) is irregular, but only the south and west walls were definite

may be presented of its presence here: (a) that this room or building was made of much cruder stones which did not appeal to the later masons who rifled the main ruin; (b) that this represented a discard pile where all of the stones not worth carrying away

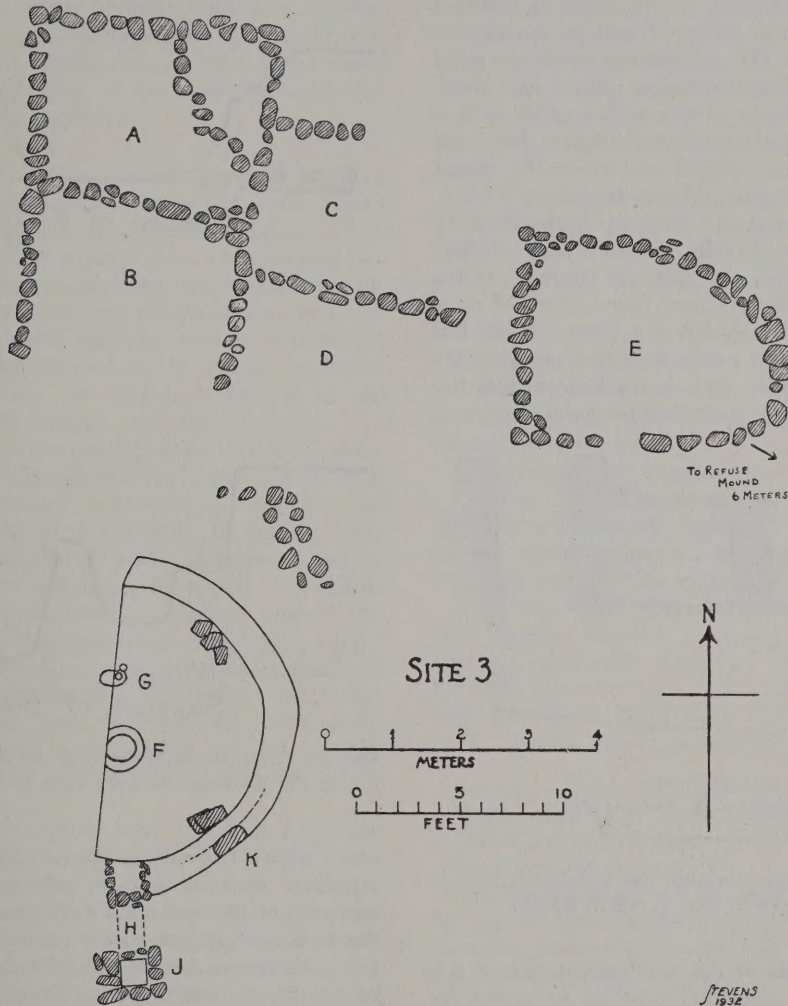


FIG. 10. Ground plan of Site 3, Alkali Ridge.

at the time of excavation. The curved line of stones connecting the northwest and southeast corners was, at best, only suggestive of a wall, and it is quite possible that the northeast corner was also rectangular. A small mystery existed here in the pile of stones which covered this room while hardly a stone appeared above the surface over the main house. It was a symmetrical heap of very irregular stones, below the average size of building blocks, and 3 explanations

were tossed by these same riflers; (c) that the structure was built at a later time, subsequent to or contemporaneous with the removal of blocks from the main house.

The last supposition is almost untenable, for the pottery found beneath the pile showed no appreciable difference from that in the house. A glance at the plan adds to the complexity of the problem. It will be seen that the south wall of Room C extended almost

to the east room. Therefore, a fourth possibility must be considered, that this room may have been merely the easternmost room of the main building, abutting the east sides of Rooms C and D. Perhaps it was not a "room" at all but a turkey pen or some other kind of appurtenance.

Kiva. The kiva at Site 3, although in standard position, was the most unusual found by the expedition up to that time. The continuous bench was missing and, from the height where it should have been, the wall sloped steeply to the surface, with only a slight shoulder two-thirds of the distance from the floor. The excavation, entirely earthen-walled, except for the ventilator section, may be likened to a steep-walled bowl, the lower two-fifths and upper one-fifth of whose wall was actually perpendicular. Slightly more than one-half of the kiva was cleared, and the remains of but 2 pilasters were found. Both of these had fallen to the floor, but the stones which had composed them were easily identified, as they lay piled against the wall. Thus it would seem that this kiva had but 4 pilasters instead of the usual 6.

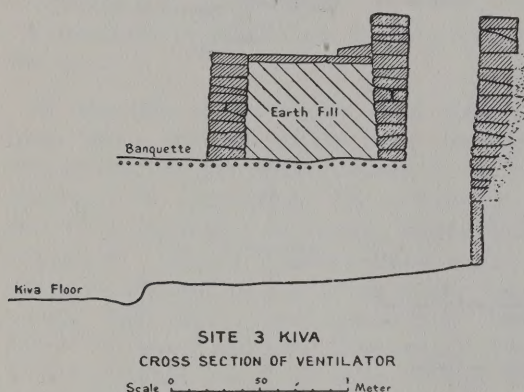


FIG. 11. Cross section through the ventilator, built-in type, in the kiva, Site 3, Alkali Ridge.

The bottom stone of the southeastern pilaster was fortunately still in place and provided an answer for the rather puzzling question of how, in a kiva without a bench, the roof could be supported by pilasters, unless indeed these pilasters had been built upon the floor. This stone was set into the shoulder already mentioned at a height two-thirds of the distance from the floor to the top of the wall and, apparently, the 5 other stones found on the floor beneath it were stacked on top of this to form a pilaster of the early type described in detail and contrasted with "standard" Mesa Verde pilasters on pages 210-11.

The only other stonework was in the ventilator section at the south end (fig. 11), one of the best preserved examples encountered. The deep southern

recess was absent, but otherwise this feature was of the kind characteristic of the fully developed San Juan kiva. The opening of the horizontal shaft into the kiva was 92 centimeters high and 39 centimeters wide, and the shaft was lined by 2 walls of coursed masonry. Above this was a narrow adobe platform as long as the shaft was wide plus the thickness of the

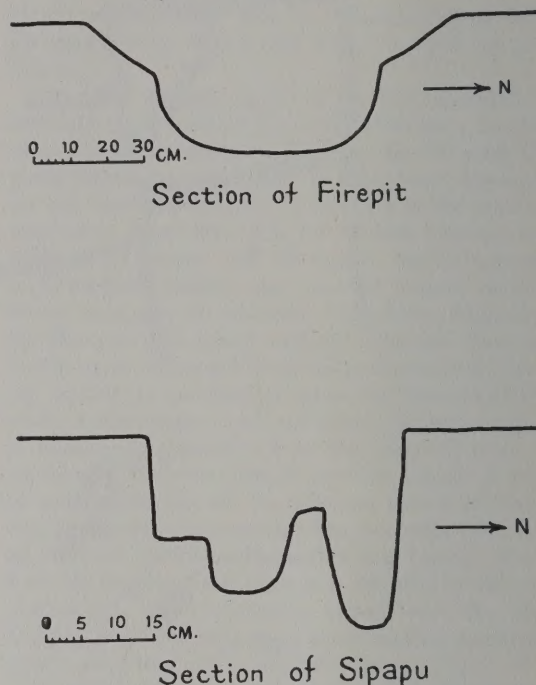


FIG. 12. Cross sections through the firepit and sipapu in the floor of the kiva, Site 3, Alkali Ridge.

walls which formed the shaft. The platform was supported by small wooden poles resting on top of the walls of the horizontal shaft (fig. 11). Here only this kiva exhibited something resembling the ordinary bench or recess. Immediately above this, at the back of the bench, rose a perpendicular stone wall. Of crudely coursed-sandstone blocks, it formed part of the south wall of the kiva and, if our theory of 4 pilasters is correct, may have helped materially in the support of the roof as well.

Behind this wall, and at the level of its top, a number of large slabs, resting on back fill, extended still farther south until they met the wall of the upright shaft. These slabs may have represented the plaza level with the flue of the upright shaft extending slightly above it. The vertical shaft was rectangular, surrounded by walls made of squarish sandstone blocks, for the most part well trimmed. A cross section of this ventilation unit is shown in figure 11.

No deflector was found between the ventilator shaft and the firepit nor was there any indication in the floor that there ever had been one.

The form of the firepit was unusual (figs. 10, 12). Our impression, on excavation, was that it had originally been a relatively shallow basin with the central part subsequently deepened. It was filled with ash.

The sipapu (?) certainly gave evidence of revision (figs. 10, 12). It consisted of a basin quite unlike the usual hole called sipapu and 2 other holes which were more normal. One of the latter was inside the basin and one was tangent to it.

REFUSE MOUND. The refuse mound at Site 3 lay rather more to the east than to the south. It had been disturbed by previous excavation, and there was evidence that at least 1 burial had been removed. Because of the extent of disturbance, we did not excavate completely but restricted our operations to 2 trenches, at right angles to each other, laid out in reference to the least disturbed portions of the mound as observable on the surface. In addition, 2 corners of the intersection of the trenches were dug (fig. 10).

South of the refuse mound was a firepit. It consisted of 2 parts distinguished by difference in level. The eastern part was 76 centimeters deep and the western part only 40 centimeters. In both sections the dirt walls were baked hard. The eastern section seems to have been slab lined. Four slabs were still in place and a sufficient number of others were in the pit to have completed the lining. They were unusually thick for fireplace slabs, 8 to 12 centimeters. They also showed evidence of very hot fire, being much more burned than fireplace slabs found in the houses and kivas on Alkali Ridge. We did not find evidence to indicate any specialized use of this firepit.

BURIALS. Five burials were found in the refuse mound, 4 human, and 1 turkey. The turkey burial was interesting in that it was definitely a formal interment with a large black-on-white jar fragment accompanying it. The turkey had a broken femur, which had healed in such manner as to make 1 leg considerably shorter than the other. One is tempted to infer from this that the turkey, which must have walked with a marked limp, had been a pet or considered in some way above the ordinary run and had therefore received honors after death.

The human burials were of 1 adult, 1 adolescent, and 2 children. The adult, Burial 3, was buried in extended position, lying on its back (fig. 192, *a*). The adolescent was placed on its right side in a partly flexed position. The absence of all bones below the knee made exact determination of the degree of flexing impossible. Of the children, only part of the skull of one remained, and the other was represented by small fragments of skull and pelvis

and fragmentary long-bones. Thirteen whole or partial vessels classifiable as Pueblo II types were found accompanying these burials. Burial 2 had 4, the largest number. The practice of placing large fragments of vessels in graves in place of whole ones was well illustrated here. Of the 13 found, 5 were merely large pieces of vessels. They were large enough and found in such relationship to the skeleton that the probability is small of their having been merely part of the general fill. This practice has been noted before, particularly with child burials, and it is interesting to note that the child, Burial 4, was accompanied by only 1 whole vessel and by 2 large sherds.

A Pueblo-type arrow-point (fig. 172, *j*) was found in the fill about 2 centimeters above the right eye of Burial 3. There was no way, however, in which its connection with the skeleton could be proved.

BURIAL 1. Adolescent. Age: 15-17.

Depth: skull 28 centimeters below present surface.

Condition: disturbed by burrowing animal and pot-hunters; right arm, both legs below the knee, and lumbar vertebrae missing.

Orientation: head to east.

Position: fig. 46, *a*; femurs inclined to right; legs probably were slightly flexed but may have been extended; torso supine; face to right.

Cranial deformation: lambdoidal flattening.

Associated finds: large black-on-white bowl with strap handles inverted over skull (fig. 113, *b*; figs. 111, *s*; 72, *a*); small corrugated jar with single horizontal loop-handle (fig. 153, *d*); black-on-white bowl; large base sherd of corrugated jar; and a mano (fig. 51, *o*). All the objects were at the head.

BURIAL 2. Child. Age: 5-7.

Depth: skull 24 centimeters below present surface.

Condition: part of skull only.

Position: face down.

Associated finds: black-on-white ladle (fig. 114, *c*; fig. 69, *e*); black-on-white bowl (fig. 74, *f*); black-on-white bowl (fig. 70, *c*); base of corrugated jar used as platter (fig. 153, *f*).

BURIAL 3. Female. Age: 21-35.

Photograph: fig. 192, *a*.

Condition: skull and pelvis crushed; no vertebrae or clavicles present.

Orientation: head to northeast.

Position: fig. 46, *b*; extended; torso supine; face up; lower left forearm bent in to bring hand over pubic region.

Pathology: abscess cavity in tibia head.

Associated finds: black-on-white bowl (fig. 113, *g*; fig. 73, *d*); black-on-white ladle (fig. 114, *g*; fig. 70, *d*); to right and left of head, respectively; small crudely chipped sandstone slab cover for the ladle.

BURIAL 4. Infant.

Depth: 8 centimeters below present surface.

Condition: part of skull only, facial bones gone.

Position: face up.

Associated finds: small black-on-white bowl (fig. 114, *d*; fig. 71, *e*); half of black-on-white bowl, under skull (fig. 72, *b*); large sherd from corrugated jar, including part of the rim.

BURIAL 5. Turkey.

Position: tightly flexed.

Peabody Museum catalogue no. 33-7-10/576.

Pathology: healed femoral fracture, knit in such fashion as to shorten the leg considerably.

Associated finds: large sherd of black-on-white water jar.

Taxonomic Position of Site 3

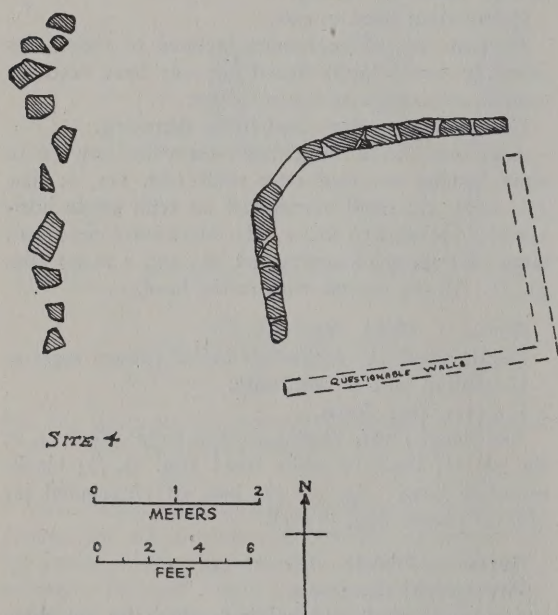
PECOS CLASSIFICATION. Pueblo II period.

GILA PUEBLO SYSTEM. Mancos Mesa Phase.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Mancos Focus.

SITE 4 (ABAJO: 7: 4)**MAPS AND PLANS. Fig. 13.**

During the course of various reconnaissance trips to different parts of the mesa, it was noted that some very small sites existed which seemed to be single isolated rooms without kivas. As one of these occurred one-quarter of a mile

**SITE 4****FIG. 13. Ground plan of Site 4, Alkali Ridge.**

down the road from Site 3, it was decided to dig it after we had finished with that site.

The excavation produced definite coursed-masonry walls on the west and south sides of a room (fig. 13), suggestions of fallen walls on the other 2 sides, but few potsherds and no

other artifacts. Only 3 potsherds were found in the fill, all bearing Mesa Verde designs. Five more were found on the surface. Three of the latter were decorated, 2 definitely of Mesa Verde character, and one which may be either Mesa Verde or Mancos. Of the 2 plain sherds, one had a white slip and presumably came from the lower part of a black-on-white jar; the other was entirely undecorated. Both, on the basis of present knowledge, may be classified as either Mesa Verde or Mancos. This is very little evidence. Such as it is it seems to favor Pueblo III.

No floor level could be determined. However, inside the room beneath a large stone slab was a burial with the skeleton extended to full length. No furnishings whatever were found with this burial.

BURIAL. Adult male.

Covered by large sandstone slab.

Condition: broken and fragmentary.

Orientation: head to north.

Position: fig. 46, *c*; extended; torso, prone; face, down; left elbow flexed upward, with left hand under chest.

Cranial deformation: occipital flattening.

Peabody Museum catalogue no. N/915.

Measurements, indices, and observations: see pages 319-21.

Pathology: see page 327.

Associated finds: none.

Taxonomic Position of Site 4

PECOS CLASSIFICATION. Pueblo III period.

GILA PUEBLO SYSTEM. McElmo or Montezuma Phase.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Undefined Pueblo III Mesa Verde Focus.

SITE 5 (ABAJO: 7: 5)

MAPS AND PLANS. Figs. 14, 15.

PHOTOGRAPHS. Fig. 86, *a*, *b*.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 111, *a*, *b*, *f-h*, *k*, *n-p*; 113, *a*, *d*, *e*, *h-j*, *l*; 114, *f*, *h-j*; 152, *c*, *f*, *i*, *j*; 153, *e*, *e'*; 175, *c*, *c'*.

Potsherds: figs. 115, *i*; 117, *c*; 118, *e*, *h*; 120, *b*, *e*, *f*; 121, *d*; 122, *a*, *j*, *k*; 123, *c*, *f*, *h*; 124, *a*; 125, *e*; 126, *a*, *b*; 127, *c*, *i*; 129, *k*; 131, *a*, *c*, *d*, *f*, *i*, *k*; 132, *n*, *r*; 133, *d*, *m*; 134, *f*; 135, *i*; 138, *f*, *p*; 140, *f*, *k*; 143, *v*; 144, *a*, *e*, *f*, *i*; 145, *e*, *g*; 147, *h*; 148, *d*, *e*, *k*, *r*; 150, *q*; 151, *n*; 154, *f*; 157, *f*; 162, *d*, *o*.

Drawings of pottery designs: figs. 68, *c*, *c'*; 69, *d*; 70, *a*, *b*, *e*; 71, *a-c*; 72, *c*; 73, *e*; 77, *p*; 78, *q*.

Objects of stone: figs. 49, *c*; 51, *b*, *j*, *n*, *q*; 171, *g*; 172, *h*, *n*; 173, *d*.

Objects of bone: figs. 176, *e*; 187, *b*, *e*.

ILLUSTRATIONS OF BURIALS AND SKELETAL MATERIAL.

Figs. 190, *a-c'*; 191, *a-b'*; 192, *b-d*, *f*, *h*, *j*, *k*.

At the conclusion of work at Site 3 a decision was made to continue excavation in sites showing absence of Mesa Verde pottery on the surface, as such procedure seemed most likely to produce useful evidence of Pueblo II. In the preliminary reconnaissance the most promising site located lay west of the main wagon road, on a slight ridge only half a mile south of Site 1. Here were depressions marking 2 kivas, indications of a single-room stone house and other domiciliary structures, and an apparently undisturbed refuse mound, rather larger than the average, with only non-Mesa Verde pottery visible on the surface. Before excavation it was believed that this might be the prototype of the double-kiva unit, so common during Mesa Verde times.

The clearing of the kivas, however, soon established the fact that they were not built at the same time; and consideration of the finds in them together with their positional relationship with the above-ground house remains cast grave doubts on the probability of simultaneous use. For the fourth successive site, the house remains were in part unsatisfactory. There was evidence of the 3 different types of walls, coursed masonry, post, and upright slab, which had been tantalizing us since the exca-

vation of Site 2, but, as before, inconclusive as to sequence, and also, with the exception of the coursed-masonry house, as to form. The refuse mound, however, more than came up to expectations. Twelve burials were found, most of them accompanied by mortuary offerings.

HOUSE AREA

COURSED-MASONRY HOUSE. In a relatively large house area the only definitely delineated structure was a single room, T, north of Kiva 2. Cruder in outline, in masonry, and in the finishing of the individual blocks than all other coursed-masonry houses found, it seems to have been, however, associated with the well-developed Kiva 2. This incongruity provided the first reasonably conclusive evidence encountered on Alkali Ridge that kiva development was in advance, architecturally, of the above-ground houses in the region.

The wall upon excavation stood from 2 to 3 courses high, built of sandstone blocks, slabs, and chunks from 30 to 60 centimeters long, from 15 to 40 centimeters wide, and from 5 to 22 centimeters thick, many obviously entirely unshaped, few with more than 1 decent face, this on the inside (fig. 86, *a*). Evidence of the liberal use of sandstone spalls was to be seen even in the small part of the wall remaining. Although the north and south walls were parallel, the corners, particularly at the eastern end, were rounded, and the wall angle usually seen in such buildings was entirely absent. With the possible exception of 1 end of the east room at Site 3, such a treatment of the corners was unique in the coursed-masonry houses uncovered on Alkali Ridge. The stones in the end walls were wider by an average of approximately 10 centimeters than those in the side walls.

A sandy floor was encountered at the level of the base of the wall, 30 to 35 centimeters below the present ground surface. No specimens were found in the house, and there was no indication that it had burned. In the east center of the floor was an opening, thought upon discovery to be the upper end of a passageway to Kiva 2, a common feature in the later units of the region.¹⁵ Careful examination of the northern part of the kiva wall, when the excavation of that structure had been completed, failed, however, to reveal the expected opening of the other end. This unanticipated failure left no alternative but to dig down through the opening to find out what lay beneath.

The opening was rimmed by a slab wall extending for 60 centimeters below the floor, at which point the hole began to widen. Completely excavated, the hole

¹⁵ Prudden, 1914.

was found to lead into a sub-floor pit, C, of large dimensions, 160 centimeters deep, with the maximum diameter at the bottom also 160 centimeters. The walls were of native earth and showed no remnants of plaster nor any signs of fire. The use of the pit for water storage was at first considered but abandoned

86, a) was merely a test pit. Undisturbed earth was found there immediately under the floor. As in so many of these small sites, except for the underground structures, the depth of occupation was slight.

JACAL HOUSE. The south wall of Room T was but 1 meter from the north wall of Kiva 2. Directly

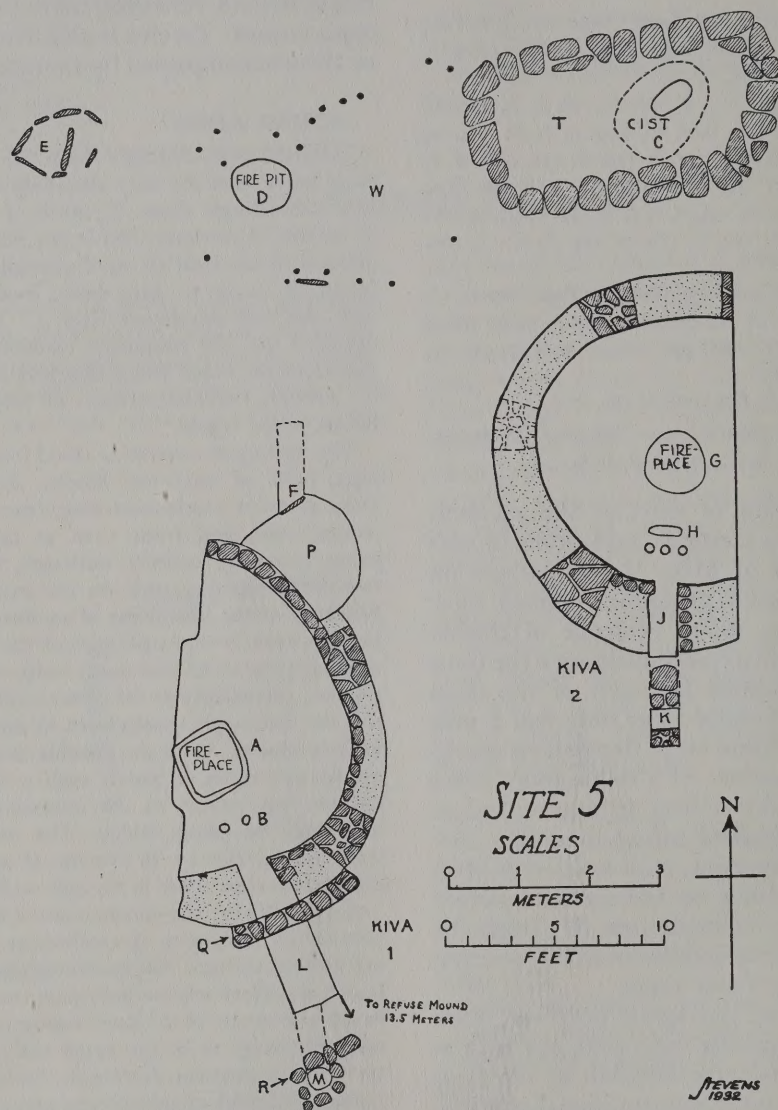


FIG. 14. Ground plan of Site 5, Alkali Ridge.

as impossible. To hold water some sort of impervious lining would have been necessary, and no evidence of such appeared. Eliminating this interesting possibility, the most likely explanation is that the pit was used for the storage of corn or other dry materials.

The shallow hole in the center of the room (fig.

to the west of Room T post holes were found, 8 to 10 centimeters in diameter and extending 40 to 50 centimeters below the ground surface. A glance at the ground plan shows that the posts, 18 in number, seem to fall into 2 very roughly parallel groups, sufficiently separated to permit the assumption that they belonged to jacal walls similar to those of Sites 9

and 12. Firepit D seems to support this supposition, particularly when compared with Room D, Site 9 (fig. 18). The remnants of posts in the holes were greatly rotted, little more than brown powder remaining in many of them, and they were entirely worthless for tree-ring studies. To anticipate a little, part of the reason that our post house finds in the earlier part of the season contrast so poorly with the same type of house found later is that at both Sites 2 and 5 the posts were not charred, indicating that the buildings did not burn, or at least that the fires were not sufficiently bad to burn the lower parts of the posts. The reverse favors the archaeologist in many ways. Much has already been said about the preservation of roof structure in charred debris, but destruction by conflagration is exceptionably valuable to excavators of post-walled buildings. First, the posts themselves are better preserved, thereby increasing the chances or at least the ease of locating them and also increasing the possibility of tree-ring dating. Second, the fire often bakes the adobe packed around the posts so that the nature of the wall aside from the main uprights can be determined, as will be seen in Sites 9 and 11 described below.

SLAB HOUSE. The house of upright slabs, of which an example had been found at Site 2, was forcibly suggested at Site 5. Large numbers of slabs of the proper size and shape were found in the house area, particularly west and south of the post house, some at considerable depth. Unfortunately, only one remained standing, S. of firepit D. North of this slab were a few square inches of good adobe floor into which one of the posts described above had been driven. Although this scrap of evidence is much too small to prove the point, it indicates the possibility of the presence of slab-walled rooms here preceding the post structures, as at Site 2. I hasten to emphasize, in the interests of sound archaeology, that the evidence here would count for very little indeed were it not for the more conclusive finds at several other sites on the mesa, permitting us in this case to give a reading of the evidence which, unsupported, could hardly convince on its own merits.

OTHER STRUCTURES. West of the posts was a small roughly pentagonal structure of upright slabs, E, divided into 2 compartments by a single slab 63 centimeters long. This was probably a storage bin, but the absence of associated artifacts and the lack of any continuous floor levels prohibit assigning it to a specific phase of the occupation of the site. It occurred in that part of the site where the greatest number of loose slabs were found, but this, in itself, is not enough evidence to date it.

The 1 remaining feature of interest probably belonging in a consideration of the house area was a subterranean chamber, P, apparently not a pit house, south of the area of posts and slabs. However, since it was cut into in the construction of Kiva 1, it will be described with that structure.

Kivas. Upon excavation of the kivas it was seen that our original supposition that we had found an early "double-kiva unit" was probably incorrect. The architecture and orientation of the 2 kivas cast grave doubt upon the probability of their simultaneous construction, and these factors coupled with the nature of the house remains seem to preclude contemporaneous use. A glance at the plan (fig. 14) will show the variation in orientation. Apparently Kiva 1 was associated with the jacal house, which probably extended farther to the west than shown on the plan, although no definite evidence was found to that effect. Kiva 2, by its position, seemed to have been associated with the stone house. By this token and by certain indications in the fill, it is assumed that Kiva 2 was the later of the 2. The probability of this is strengthened by the architectural similarity between Kiva 2 and the kiva at Site 6, an early Mesa Verde site.

KIVA 1. This kiva, in its lack of standardization, fitted in very well with other Pueblo II kivas. It had a bench 90 to 100 centimeters high, 6 pilasters, and a southern recess only slightly deeper than the other recesses. There was considerably more masonry here than is usually met with in kivas of this period, owing in part at least to the presence of the earlier subterranean structure, P. The eastern half, at least, of the wall beneath the bench was faced with coursed masonry as was the upper wall behind the southern recess for part of its length. West of the opening of the horizontal ventilator shaft, the lower wall was of undisturbed earth, and the western part of the upper wall of the southern recess was of the same material.

The ventilator unit (fig. 15) was built in, not tunneled,¹⁶ with 2 stone walls, one forming part of the back wall, Q, of the southern recess and one forming the north wall, R, of the vertical shaft. Both of these walls rested in part upon the roof of the horizontal ventilator shaft. The roof of the horizontal shaft was of wood, with long poles running parallel to the shaft and short members lying across it. These cross pieces were much larger than usual, 8 to 10 centimeters in diameter, and were set into the earth walls on both sides of the excavation. The reason for this was that the long poles were laid *on top* of the cross pieces and bore directly part of the load of the masonry walls, Q and R, as shown in figure 15.

The kiva floor was almost lacking in excavated features, but those present were unusual. The firepit,

¹⁶ For discussion of ventilator development, see pp. 208-09.

A, was shallow, 14 centimeters deep with the bottom on bedrock, almost rectangular, and had an adobe collar or rim much larger than usual. The collar was 20 to 25 centimeters wide and rose 5 centimeters above the floor. The other unusual feature consisted of 2 holes, B, slightly over 10 centimeters in diameter, 9 to 10 centimeters deep, to bedrock, with their centers 35 centimeters apart and situated between the firepit and the southern recess. These may have been holes for a ladder or perhaps a deflector.

probably because of this, most of the stones in the pilasters had fallen in. The western pilaster had fallen completely from the bench and the stones lay in a stack on the floor directly in front of the position they had occupied on the bench. The bottom stone in the pile rested directly upon the floor, and a dent in the floor where it had fallen indicated that the pilaster fell at the time of abandonment or shortly thereafter, before an appreciable amount of fill had accumulated. Despite the shallowness of the excava-

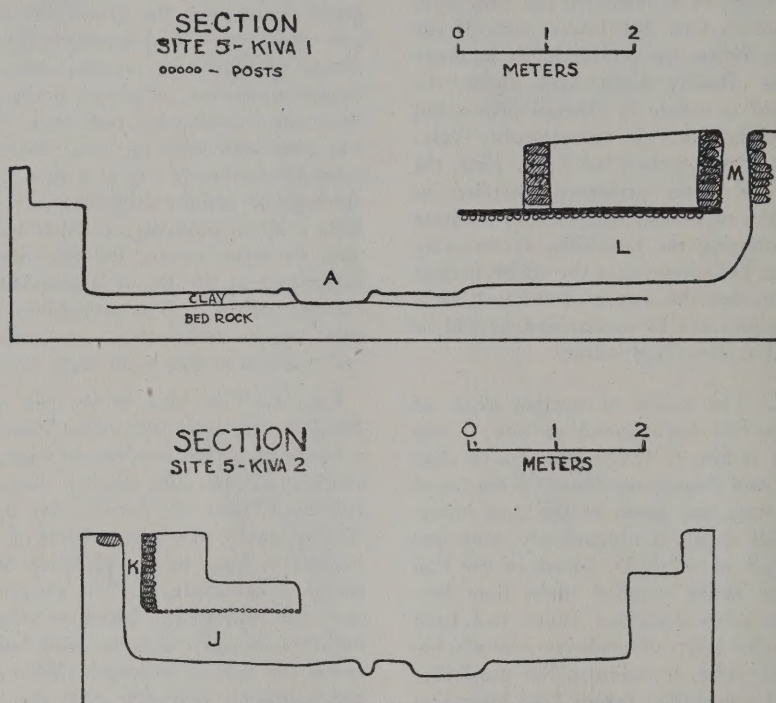


FIG. 15. Cross sections through the kivas at Site 5, Alkali Ridge.

Behind the northeast banquette was the remnant of an older pit, P, which had been cut through during the construction of the kiva. It was filled with earth and refuse material. An entrance passageway, closed by a large slab, F, led into this pit. The nature of the pit, particularly its depth, for the floor of the pit was lower than the floor of the kiva, did not suggest a disused entry to the kiva, but rather an independent unit connected with an earlier occupation of the site. The only possible parallel to this which was found on Alkali Ridge was the pit room at Site 12, N in figure 23.

KIVA 2. The second kiva at Site 5 was located directly south of the stone house and very close to it. Many stones were found in the fill, presumably from the walls of the house. Slightly more than half of the kiva was cleared. It was shallower than usual and,

tion, the bench was unusually high, between 90 and 100 centimeters above the floor. It is, of course, possible that this kiva was, when in use, no shallower than others but extended more than usual above the surface of the ground.

Kiva 2 had 6 pilasters and, as in Kiva 1, the southern recess was but little deeper than the others. The walls were of natural earth with the exception of a small patch of masonry in the lower wall beneath the western end of the southern recess and under the southwestern pilaster (fig. 86, b).

The ventilator was built in (fig. 15). The walls of the horizontal shaft were of stone. There were 2 large slabs on each side, the largest 80 centimeters long by 40 centimeters high. Above the slabs, completing the walls, was a small amount of crudely coursed masonry. The horizontal shaft was roofed by small poles, 3 to 4 centimeters in diameter and

2 to 3 centimeters apart, resting on top of the stone walls. The vertical shaft had a stone wall on its north side running from the roof of the horizontal shaft to the surface. The other 3 walls were of undisturbed earth, except for the very top of the shaft which had a low rectangular coursed-masonry collar. Slabs on the surface directly to the north of the opening of the vertical shaft suggested that the earth fill above the ventilator was paved as in the ventilator unit at Site 3 (fig. 11).

The floor features were almost as simple as those of Kiva 1. The almost circular fireplace, G, was 17 centimeters deep. South of this was a hole, H, 42 centimeters long, 20 centimeters wide, and 14 centimeters deep. Because of the size, shape, and position of this hole, it may be assumed that it was a slot in which was set a slab deflector. Between this and the opening of the ventilator shaft were 3 holes, 10 to 14 centimeters in diameter and only 4 to 5 centimeters deep. These may have been ladder holes. The fact that there were three of them, however, may very well indicate some other use. Of course, two of them may have been ladder holes and the third something else, or 2 ladders of different types or widths may have been used, or there may have been a ladder of unknown type which utilized all 3 depressions.

A very few pieces of early Mesa Verde pottery were found in the fill of this kiva, the stone house, and in the refuse mound; not many, but enough to make us suspect that the new style was just becoming known as this site was abandoned.

REFUSE MOUND. The refuse mound at Site 5 was the most satisfactory one encountered. Although fairly well riddled by burrowing animals, it was completely untouched by pot-hunters. Because of its undisturbed condition, it was excavated completely. Twelve burials were found, of which ten were accompanied by mortuary offerings. Thirty-five pottery vessels were found with these burials. In 2 cases there were 8 associated vessels, the maximum number found by the expedition with a single burial. The total included 12 bowls, 10 jars, 6 pitchers, 4 ladles, 1 seed-bowl, 1 vessel made inside a basket (fig. 153, *e*, *e'*), and 1 miniature bowl. The painted pottery was of the type known as Mancos Black-on-white, except for 1 bowl of Tusayan Polychrome.

BURIALS. Two of the burials consisted, when discovered, of part of the skull only. These were of children, one accompanied by a black-on-white bowl, the other without mortuary offering. Of the remaining 10 burials: seven were ordinary flexed burials, four lying on the left side, three on the right side; and three were placed flat on the back, two with legs flexed to the right and one with legs flexed to the left.

BURIAL 1. Female. Age: about 50.

Photographs: figs. 191, *b*, *b'*; 192, *j*.

Depth: skull 35 centimeters below present surface; left heel, 54.

Condition: disturbed by burrowing animal; part of mandible and most torso and arm bones missing; left scapula, right humerus, and 1 dorsal vertebra found in burrow under shoulder region; clavicle and right ulna found nearby.

Orientation: head to east.

Position: fig. 46, *d*; flexed to left; torso missing; face to left.

Cranial deformation: slight lambdoidal flattening.

Peabody Museum catalogue no. N/921.

Measurements, indices, and observations: see pages 322-26.

Associated finds: black-on-white pitcher with 4-strand vertical loop-handle to left of pelvis (fig. 111, *o*).

BURIAL 2. Male. Age: 18.

Photograph: fig. 192, *b*.

Depth: skull 34 centimeters below present surface; left foot, 54.

Condition: nature of breaks in right frontal bone and orbit suggest violent death, see page 327.

Orientation: head to east.

Position: fig. 46, *e*; flexed to left; torso supine; face to left. Right forearm across torso just above pelvic region. Strikingly similar in position and orientation to Burial 1. They were 2 meters apart; absolutely parallel with heads and faces identically placed; pelvis position similar and both have the same kind of pitcher to the left of the pelvis. They were even placed at the same depth; both head and foot depths below present surface, at least, correspond within 1 centimeter.

Cranial deformation: lambdoid flattening.

Peabody Museum catalogue no. N/922.

Measurements, indices, and observations: see pages 317-18.

Pathology and anomaly: see page 327.

Associated finds: black-on-white pitcher (fig. 111, *p*); black-on-white bowl (fig. 71, *b*); small corrugated jar (fig. 152, *c*); all to left of pelvic region.

BURIAL 3. Adolescent. Age: 14-15.

Photograph: fig. 192, *d*.

Depth: skull at present surface level; pelvis, 16.

Condition: excellent, including terminal phalanges. Right side of skull, however, ruined because of the extreme shallowness of the burial. At some time part of the skull protruded and was broken off.

Orientation: head to east.

Position: fig. 46, *f*; tightly flexed to left; torso on left side; face to left. Arms and legs both folded tightly against torso.

Cranial deformation: occipital flattening.

Peabody Museum catalogue no. N/923.

Pathology and anomaly: see page 327.

Associated finds: none.

BURIAL 4. Infant.

Condition: disturbed by burrowing animal; top of skull, 1 humerus (7.6 cm. long), tibia fragment and a few ribs only.

Position: face up.

Pathology and anomaly: 2 ribs fused.

Associated finds: black-on-white bowl (fig. 113, *e*; fig. 70, *b*) to left of skull.

BURIAL 5. Infant.

Depth: 44 centimeters below present surface.

Condition: part of skull and 1 femur (11 cm. long) only.

Position: face up.

Peabody Museum catalogue no. N/924.

Pathology: see page 327.

Associated finds: none.

BURIAL 6. Male. Age: 45-75.

Photographs: figs. 191, *a-a'*; 192, *k*.

Depth: skull 24 centimeters below present surface; distal end of right tibia, 38.

Condition: disturbed by burrowing animal; skull found base up.

Orientation: head to northeast.

Position: fig. 46, *g*; flexed to left; torso supine; skull disturbed. Arms bent in toward pubic region with right hand over pelvis and left hand under pelvis.

Cranial deformation: asymmetrical lambdoidal flattening.

Peabody Museum catalogue no. N/925.

Measurements, indices, and observations: see pages 317-321.

Pathology and anomaly: see page 327.

Associated finds: bowl made in "cylindrical" basket (fig. 153, *e*, *e'*) to left of pelvis; black-on-white bowl (fig. 113, *j*; fig. 71, *c*) to right of knees.

BURIAL 7. Female. Age: 25-30.

Photograph: fig. 192, *c*.

Depth: head and foot 26 centimeters below present surface.

Condition: all bones fragmentary.

Orientation: head to east.

Position: fig. 46, *h*; flexed to right; torso on right side; face to right. Left hand over pubic region; right arm extended along side.

Peabody Museum catalogue no. N/926.

Measurements, indices, and observations: see pages 322-26.

Associated finds: half of the body of a large black-on-white pitcher resting on right side of skull.

BURIAL 8. Child. Age: 5.

Photograph: fig. 192, *f*.

Depth: skull 27 centimeters below present surface; left foot, 35.

Condition: pelvis, lower limbs, left humerus and clavicle, and fragmentary skull only.

Orientation: head to northwest.

Position: fig. 46, *i*; flexed to right; torso absent; face to right.

Peabody Museum catalogue no. N/927.

Associated finds: Pot 1, large black-on-white bowl (figs. 113, *a*; 69, *d*) partially covering skull; Pot 2, medium-sized corrugated jar (fig. 152, *j*) to left of upper torso; Pot 3, black-on-white bowl (fig. 113, *l*) to left of lower torso; Pot 4, black-on-white seed bowl (fig. 111, *b*) inside Pot 3; Pot 5, black-on-white ladle (figs. 114, *j*; 73, *e*) inside Pot 3; Pot 6, unpainted bowl inverted over Pot 7 to right of lower torso; Pot 7, black-on-white ladle with handle complete (figs. 68, *c*, *c'*; 175, *c*, *c'*) along right side; Pot 8, black-on-white jar with 2 lug handles (fig. 111, *g*) to right of upper torso.

BURIAL 9. Male. Age: 36-40.

Photographs: figs. 190, *a*, *a'*; 192, *h*.

Depth: skull 36 centimeters below present surface; left foot, 42. Rests almost on bedrock.

Condition: fragile but almost complete, including terminal phalanges of hands and feet.

Orientation: head to southeast.

Position: fig. 46, *j*; flexed to right; torso on right side; head to right. Forearms bent in to bring hands over pubic region.

Cranial deformation: lambdoidal flattening.

Peabody Museum catalogue no. N/928.

Measurements, indices, and observations: see pages 317-21.

Pathology and anomaly: see page 327.

Associated finds: Pot 1, black-on-white pitcher (fig. 111, *b*) to right of shoulder; Pot 2, incised corrugated jar with plain base (fig. 152, *f*) to right of lower torso; Pot 3, black-on-white bowl, to right of femurs; Pot 4, black-on-white seed bowl (fig. 111, *a*) between Pot 2 and pelvis; Pot 5, plain white slipped jar with short neck which at one time had been higher (fig. 111, *k*) to left of feet; Pot 6, black-on-white ladle (figs. 71, *a*; 114, *i*) to left of upper torso; Pot 7, red- and black-on-orange polychrome bowl (fig. 114, *f*) to left of shoulder; Pot 8, black-on-white ladle (figs. 72, *c*; 114, *h*) in Pot 7.

BURIAL 10. Male. Age: about 50.

Depth: skull 42 centimeters below present surface.

Condition: skull badly smashed.

Orientation: head to northeast.

Position: fig. 46, *k*; legs flexed to right; arms tightly flexed to body with forearms inside their respective upper arms; torso supine; face to right.

Cranial deformation: lambdoid flattening.

Peabody Museum catalogue no. N/929.

Measurements, indices, and observations: see pages 319-21.

Pathology and anomaly: see page 327.

Associated finds: Pot 1, black-on-white pitcher (fig. 111, *n*) to right of torso; Pot 2, black-on-white bowl (figs. 70, *e*; 113, *b*), to right of skull; Pot 3, part of black-on-white bowl at knees; Pot 4, incised jar (fig. 152, *i*) at feet; Pot 5, small lump of baked clay hollowed out perhaps in childish imitation of a pot found to left of pelvis.

BURIAL 11. Female. Age: 56-75.

Photographs: fig. 190, *b*, *b'*.

Depth: skull 12 centimeters below present surface; feet, 22.

Condition: legs disturbed by burrowing rodent, also by fire in the refuse at this point, so that leg bones are disarranged, very fragmentary, and charred. Right forearm missing.

Orientation: head to northwest.

Position: fig. 46, *l*; flexed to right; torso supine; face to left. Right arm bent in toward pubic region.

Cranial deformation: lambdoidal flattening.

Peabody Museum catalogue no. N/930.

Measurements, indices, and observations: see pages 322-26.

Pathology and anomaly: see page 327.

Associated finds: black-on-white pitcher (fig. 111, *f*) to right of skull.

BURIAL 12. Male. Age: 40-44.

Photographs: fig. 190, *c*, *c'*.

Depth: skull 4 centimeters below present surface; left foot, 10.

Condition: excellent except for the right side of the pelvis and the right knee which had protruded above the surface and were missing.

Orientation: head to east.

Position: fig. 46, *m*; flexed to left; torso to left side; face to left; right upper arm extended along right side, forearm bent at right angle to bring hand to left of torso; left arm extended along left side.

Cranial deformation: lambdoidal flattening.

Peabody Museum catalogue no. N/931.

Measurements, indices, and observations: see pages 319-21.

Pathology and anomaly: see page 328.

Associated finds: Pot 1, large corrugated jar to left of pelvis; Pot 2, black-on-white bowl (figs. 70, *a*; 113, *d*) to left of torso in right hand; Pot 3, black-on-white bowl (plate 113, *i*) to left of upper torso.

Taxonomic Position of Site 5

PECOS CLASSIFICATION. Pueblo II period.

GILA PUEBLO SYSTEM. Mancos Mesa Phase.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Mancos Focus.

SITE 6 (ABAJO: 7: 6)

MAPS AND PLANS. Fig. 16.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 114, *k*, *k'*; 153, *i*.

Potsherds: figs. 135, *f*; 143, *x*; 144, *g*; 154, *b*; 156, *a*, *c-o*; 164, *a*, *e*; 166, *e*, *g*, *i*, *o*; 168, *a*, *e*.

Drawings of pottery designs: figs. 76, *i*; 77, *g*, *h*, *i*, *j*; 78, *a*, *b*; 79, *d*, *h*, *j*, *q*; 80, *e*, *f*, *h*, *j*.

Objects of stone: fig. 47, *c*.

Objects of bone: fig. 176, *c*, *f*.

Site 6 was a small unit approximately 1 mile north of Site 1. It was situated directly to the east of Grassy Glade, about 100 yards into the timber, not far from 2 large sites which have been called Sites 6A and 6B. As the excavation of non-Mesa Verde Site 5 was being completed, the desirability of clearing another early Mesa Verde site became apparent; one which perhaps might be earlier than Site 1 and which might reveal more of the nature of the transition from the "Mancos" type to the Mesa Verde. The potsherds on the surface of Site 6 indicated that this site might be helpful in that respect.

House. The house at Site 6 was of 4 rooms arranged in a solid block approximately 5 meters square slightly west of north from the kiva, figure 16. It had not burned and consequently revealed very little of actual construction methods. The lower course of the walls was all that remained. The stones were much larger and more irregular than at Site 1, Unit 1, but they had been squared off to a certain extent. The stones ran from 25 to 50 centimeters in length, from 15 to 30 centimeters in width, and from 5 to 15 centimeters in height. As in Site 1, the walls were of but single stone width. The complete outline was traceable only in the northwest room. Much of even the bottom course was missing in the other walls. Although some stones were lying around on the surface and numbers were encountered in the kiva fill, not nearly enough were present to rebuild a house of the size suggested by the ground plan. This phenomenon had been encountered previously at Site 3, and the probable explanation is that the stones were used in the large buildings which occupy almost all of the commanding ridges of the mesa. Many sandstone blocks from Site 6 probably went into Sites 6A and 6B.

The only artifacts found in the rooms were a large corrugated jar on the floor near the center of the southeast room and a small number of typically Mesa

Verde potsherds. Fireplaces, however, almost totally lacking at Site 1, were encountered in 3 of the 4 rooms. In the northwest corner of Room 4 a pit, D, was excavated to 20 centimeters below the floor level, which in all 4 rooms ranged from 20 to 30 centimeters beneath the present ground surface. The presence of upright slabs on the west side suggests that at one time the pit was lined with small sandstone slabs. When found, it was full of grayish-white ash containing a few potsherds. In Room 3 near the northwest corner was a larger and shallower firepit, C, also filled with ash. Because of the shallowness of the excavation and the absence of definition of the floor of this room, an exact determination of the outline of this pit was impossible. The firepit, B, in Room 2 was slightly east of the center, circular in form, and 16 centimeters deep. It, too, was filled with light-colored ash but showed no suggestion of slab lining. No excavated firepit was found in Room 1, but near the center of Room 1, 2 thin, flat, smooth slabs of sandstone, A, were set in the floor, flagstone fashion, and may have been part of a hearth. The larger was 26 by 25 centimeters and 4 centimeters thick, the smaller 26 by 12 by 3 centimeters; 15 centimeters in front of them were 2 stones set on edge in the floor. These might very easily have been the remains of upright slabs, the upper portions of which had broken off.

The front wall of the house had disappeared completely, but by an estimate based upon the southernmost extension of the west wall, of which almost the entire first course remained, the south wall could have been no more than 1 meter from the outside wall of the kiva. There is, of course, the possibility that no south wall ever existed and that the 2 front rooms were open in this direction. This, however, is not thought probable.

Kiva. The kiva at Site 6 was of greatest interest in its general resemblance to Kiva 2 at Site 5. It had smooth dirt walls with remnants of adobe plaster still adhering to them. The bench floor was also of native earth, very smooth, but quite irregular in width. In fact, the usual situation was reversed here in that the southern recess was the shallowest of all rather than the deepest. At one point, the southern recess measured less than 20 centimeters in depth while the northwestern recess was 52 centimeters deep. The narrowness of the bench at the south end serves to accentuate the pear-shaped appearance of the kiva. The bench was in some places even higher than that in Kiva 2, Site 5. Near the western pilaster it rose 102 centimeters above the floor. There was also marked similarity to Kiva 2, Site 5, in the pilasters.

Again, floor features were sparse. There was a firepit, H, and a slot, G, 14 centimeters deep where the deflector had been between the firepit and the ventilator opening. Two slabs found leaning against the

wall under the northwestern recess may have served as deflector and door for the ventilator opening. The fireplace, 24 centimeters deep, was originally an earthen pit and was subsequently lined with sandstones set on edge. This reduced the size of the pit appreciably in the north-south dimension. No stones were found at the northern end of the pit. The sipapu

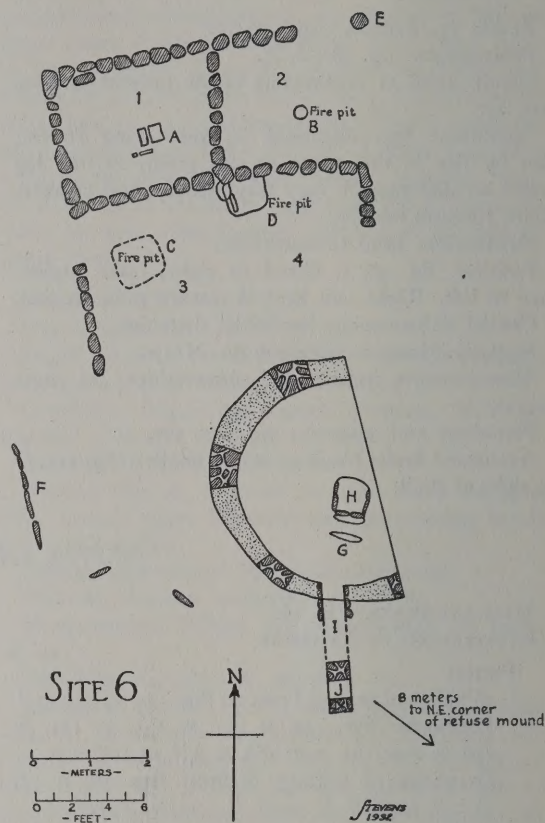


FIG. 16. Ground plan of Site 6, Alkali Ridge. The house probably had 4 rooms. F is a row of upright slabs.

was again absent. The floor itself was of natural material *in situ*, the whitish layer overlying or forming the top part of the bedrock in this region and called locally, although erroneously, "white gyp."

The ventilator shaft was built in, with coursed-stone side walls for two-thirds of its horizontal length, and an earthen floor slightly higher than the kiva floor and approximately level throughout. The southern end of the horizontal shaft and the south wall of the vertical shaft were of undisturbed earth. The north wall of the vertical shaft was of coursed stone to a depth of 1 meter. The bottom of this wall, seated on undisturbed earth, was 70 centimeters above the floor of the horizontal shaft and 25 centimeters above

the roof of that shaft, just south of the termination of the side walls. Thus the southern one-third of the horizontal shaft was a tunnel through the native earth. At the top of the vertical shaft was the usual stone collar. In this instance no indication was found of the nature of the roof over the northern two-thirds of the horizontal shaft, but, on the basis of other kivas, we may assume that it was probably made of wooden poles.

Refuse Mound. The refuse mound, small, shallow and relatively little disturbed by pot-hunters, was excavated completely. There were no burials but a large

collection of potsherds and animal bones was made. Taxonomically speaking, this was the "purest" site discovered. Of the black-on-white potsherds found in the refuse mound all but 4 could be placed in the Mesa Verde group, either McElmo Black-on-white or Classic Mesa Verde. The 4 exceptions were Mancos Black-on-white.

Taxonomic Position of Site 6

PECOS CLASSIFICATION. Pueblo III period.

GILA PUEBLO SYSTEM. McElmo Phase.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Undefined Pueblo III Mesa Verde Focus.

SITE 7 (ABAJO: 7: 7)

MAPS AND PLANS. Fig. 17.

PHOTOGRAPH. Fig. 86, c.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 112, f; 113, c; 152, b.

Potsherds: figs. 103, dd, ii-kk, mm; 115, j; 117, a, b, d; 118, a, d, f, g; 120, b; 121, c, g, j; 122, c, e, f; 123, b, d, e, g; 125, d, b; 128, b, c; 131, b, b, o; 134, d, e, b, k; 135, g, b, j, m; 137, b; 138, n; 141, f, g; 143, i, j, s; 145, a, f, b; 147, a, b, f, m; 148, f, i, m-o; 149, k, l; 150, a, e, b, l, n, p; 151, c; 154, d, i; 157, a, c, g, i, j; 158, e, l, m; 162, c, j; 163, a, c, g.

Drawings of pottery designs: figs. 68, e; 69, a; 72, e; 73, c, f.

Objects of stone: figs. 48, e, j; 51, c.

Objects of bone: figs. 176, g; 182, a; 184, a, c; 186, a; 187, c.

After the excavation of Site 6, midway in the 1932 season, operations were transferred about 5 miles to the northward and a new camp set up at Black's Spring. A large number of sites had been observed in the reconnaissance of this part of the mesa and certain of them marked for excavation. Here, particularly amid the somewhat denser timber, sites were located which seemed from surface indications to differ from those previously excavated. Pueblo II pottery appeared on the surface of sites which showed no evidence of coursed-masonry houses. Preliminary digging in one of these near Site 7 revealed the fact that the house walls consisted of upright posts. The associated pottery was classified as Pueblo II and,

from the large amount of "exuberant corrugation,"¹⁷ seemed to be early in the period.

Site 7, the first to be dug in this north region, presented a particularly complicated situation at the outset. A small house mound indicated a coursed-masonry house. In front of this to the south was a flat area on which water stood after rains. There was no bowl-shaped depression, but the lay of the land was sufficiently unnatural in appearance to suggest the presence of a kiva. Excavation began with a test trench in this area. The material turned up in the trench was of the same nature as that found in a very rich refuse mound. Further digging revealed the fact that refuse had been thrown into a depression created by collapse of the roof of a large kiva. Search for a southern recess in this kiva resulted in the discovery that the kiva lay inside a very large pit house (fig. 17). The maximum diameter of the early subterranean building exceeded 8 meters. Unfortunately the floor of the later kiva had been let down through the central part of the earlier building so that most of the furnishings and architectural features of the floor of the original structure were destroyed. However, enough remained to establish the fact, in confirmation of the findings at Site 2, that occupation antedating Pueblo II was to be found on Alkali Ridge, and this was one of the most important discoveries of the 1932 season. The find was most encouraging and stimulated the search for similar sites which culminated in the discovery of Site 13, nearby.

The house at Site 7 consisted of a 2-room

¹⁷ Roberts, 1935, p. 13.

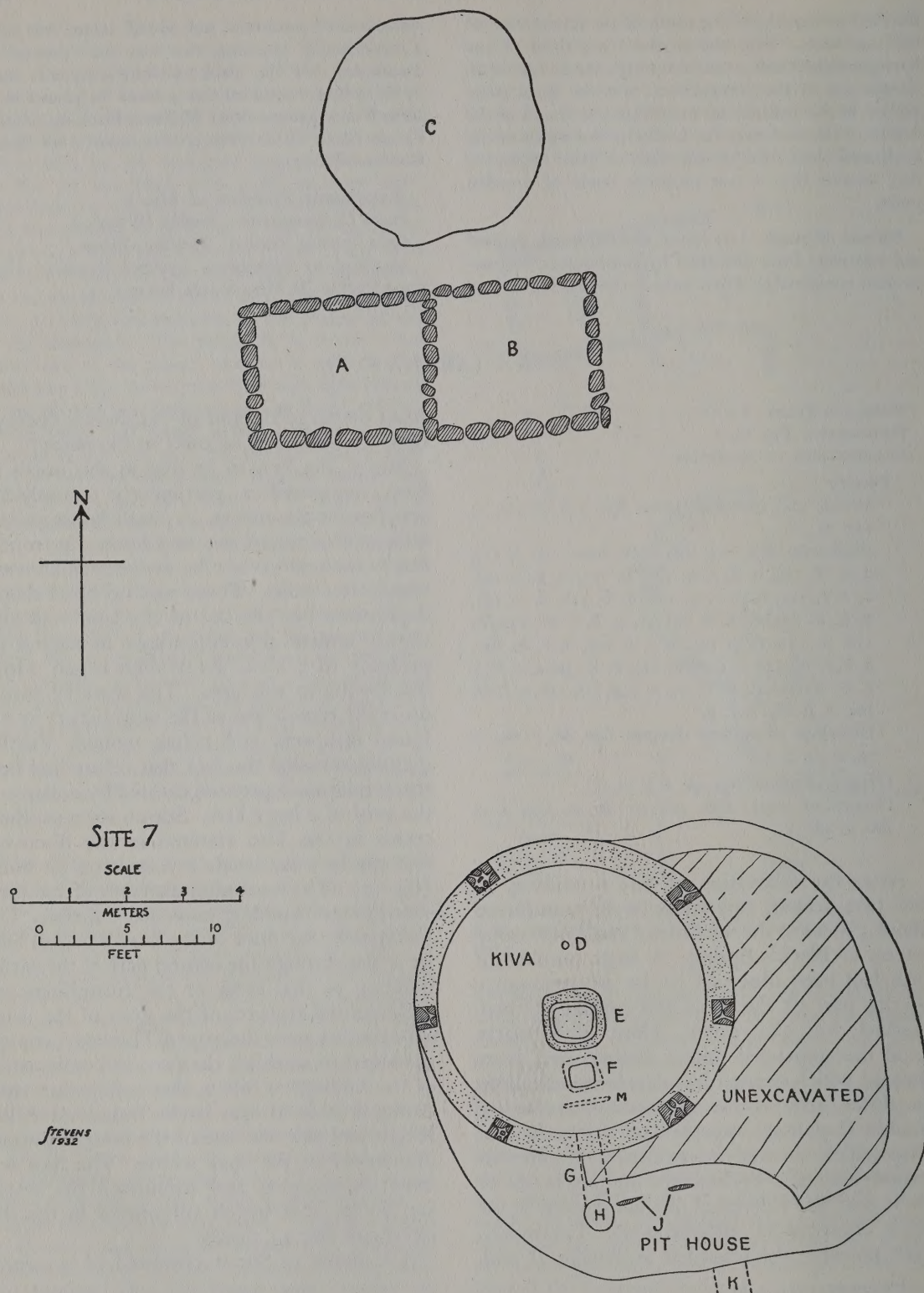


FIG. 17. Ground plan of Site 7, Alkali Ridge.

structure with walls of crudely cut coursed stones; behind this at a greater depth than the floor of the 2 rooms of the stone house was an area of occupation, the limits of which could not be definitely ascertained. The pottery associated with the house was of Pueblo II type. In the area behind this, as on that part of the floor of the large pit house not destroyed by the later kiva, Lino Gray sherds, classified as Basket Maker III or early Pueblo I predominated.

House. The stone house was located 7.10 meters north of the kiva. The lowest course of stones was found intact, most of the second course was present, and in a few places stones of the third course remained. Stones were irregular, very crudely shaped, and variable in size. For the most part they were 30 to 40 centimeters long, 18 to 24 centimeters wide, and 6 to 15 centimeters thick. The greatest variation was in length, where the range was from 15 to 48 centimeters. Sandstone spalls were used liberally.

The bottom course of the cross wall common to the 2 rooms was different from the outside walls. It was made of thick stones set on edge so that the grain of the stone ran vertically instead of horizontally. These stones were as thick as the stones of the superior courses were wide, that is, approximately 20 centimeters, and they were of about the same height. Consequently, although set on edge, they can not properly be described as slabs such as those often forming the bases of earlier walls, as in the contiguous granaries at Site 13. The way in which they were set, however, was probably a survival of the earlier tradition. Similar stones were found forming the base course of the walls of above-ground coursed-masonry buildings classified as Pueblo II in the Hopi country in north-eastern Arizona.¹⁸ In that case, too, an earlier tradition of coursed masonry on top of upright slabs was found in the vicinity. At Site 7, these stones were 16 to 20 centimeters thick, 35 to 56 centimeters long, and 30 centimeters high. The second course was similar to the courses in the other walls of the building.

No further details of construction were observable. The building apparently had not burned, and it was not even possible to determine the floor level to the complete satisfaction of the excavators. The floor was probably at the base of the wall which was 40 centimeters below the present surface. The fill consisted of red earth, some ash, and a relatively large occurrence of potsherds. Four stone axes, 3 bone awls, and a bone flesher were found on the floor of Room B. A stone "pick" (fig. 51, *c*) was found im-

bedded in the earth, partly under the wall, in the northwest corner of Room B.

North of the stone house, in the area marked C in figure 17, a hard-packed occupation level was uncovered which was 15 centimeters lower than the base of the wall of the stone house. It was littered with debris including Lino Gray potsherds. Neither painted nor corrugated pottery was found. No walls were found, but there was a large quantity of burned adobe chunks which presumably came from some building. The nature of these fire-hardened lumps of adobe was very interesting. Unlike the pieces of adobe from the Pueblo II post-and-adobe houses later found at Sites 9, 11, and 12, these showed no impressions of large posts and stones. The impressions which were found in the lumps at Site 7 were of straw or grass and of a few small twigs 1 to 1.5 centimeters in diameter. The importance of this lies in the fact that the adobe was identical in tempering with that of much of the adobe found at Site 13 in connection with the Basket Maker III-Pueblo I houses. The depth of the deposit was from 40 to 60 centimeters, and the occupation level was 15 centimeters lower than the base of the wall of the stone house. The pottery type and the nature of the adobe, correlating with the Abajo levels of Site 13, indicate occupation during Basket Maker III-Pueblo I times, probably contemporaneous with the large pit house to the south which will be described presently.

Kiva. South of the stone house was the large, flat area referred to above. It was suspected that a kiva lay beneath it, and an exploratory trench was begun near the house mound. At approximately 10 centimeters beneath the surface refuse material was encountered similar to that found in the refuse mounds of Sites 3 and 5 and in the non-Mesa Verde portions of the refuse mound at Site 2. A flexed burial of a child, accompanied by 2 Mancos Black-on-white bowls,¹⁹ was found 104 centimeters beneath the surface (for description of the burial, see p. 135).

The discovery of the north wall above the bench was the first indication that a kiva was present. As the kiva was being cleared, it proved impossible to locate the wall behind the southern recess. Above the bench was nothing but back fill, and this extended below the level of the bench, indicating the presence of an earlier subterranean structure. The back fill continued for almost 2 meters to a curving wall of native, undisturbed red earth. This wall, when followed by means of a trench to the east, was found to extend far beyond the possible confines of a southern recess, and eventually it curved toward the northeast. Excavation continued in this direction soon established the fact that the new wall belonged to an entirely

¹⁸ Peabody Museum Awatovi Expedition, report in preparation.

¹⁹ Figs. 69, *a*; 73, *c*.

different structure which was found to be an earlier pit house. The lower part of the vertical ventilator shaft, H, of the kiva was later found beneath the floor of the pit house. The upper part of the shaft had not been located in the excavation in search of a south wall behind the southern recess.

The kiva was a good example of a Pueblo II kiva after the fashion of pilasters and bench had been established but before the appearance of the built-in ventilator unit, the coursed masonry, and the specialized pilasters characteristic of the standard Mesa Verde kiva. It will be noted on the ground plan, figure 17, and in figure 86, *c* that the pilasters were relatively small, in comparison with those in the kivas at sites previously dug, that they did not flare out toward the back of the bench, that they were not so regularly shaped as in the more highly developed kivas, and that they were set back 4 to 14 centimeters from the front of the bench. The stones of which they were built were also much smaller, and these were the first pilasters found covered with plaster.

Plaster was also found *in situ* on the kiva wall beneath the bench. In the northwest quarter of the kiva, where the original excavation had extended beyond the confines of the earlier pit and consequently had a wall of undisturbed red earth and "white gyp," the plaster was very thin, only 1 to 4 millimeters in thickness. The remainder of the wall, however, came within the area of the old pit house. The kiva floor was 50 to 55 centimeters below the floor of the earlier structure and, where the new excavation had been made, the wall was again of red earth. The upper 30 to 35 centimeters of the wall below the bench extended above the old floor level. The material behind that part of the wall was the back fill in the old house and there the plaster coating was 5 to 10 centimeters thick, probably in order to hold the back fill. For the same reason, on the east and south sides the wall above the bench had been strengthened by means of stones set on edge. Most of these had fallen forward onto the bench, but a few were still in place. The kiva floor was 180 to 190 centimeters below present ground level, which appears to be 10 to 15 centimeters above the original level.

The floor features were all within the central north-south line. There was a small hole, D, 16 centimeters deep, which may have been a sipapu. South of this was an adobe-rimmed firepit, E, 14 centimeters deep which originally had been much larger (see fig. 17) and 8 centimeters deeper. When found, the disused portion of the firepit was filled with adobe mud. South of the firepit was a cist, F, 32 centimeters deep, which widened out under the floor so that the chamber was much larger than the opening at floor level.

Finally, south of the cist was a very shallow slot, M, barely visible, where a slab deflector may have been set.

The horizontal ventilator shaft, G, was a simple tunnel²⁰ dug through the undisturbed earth, as was the part of the vertical shaft, H, below the floor level of the old pit house. The nature of the vertical shaft above the old floor level is unknown.

Pit House. Because the later kiva had destroyed so much of the floor of the pit house, it was decided not to clear the latter structure completely. Plans were made to return to Site 7 and complete the excavation of this house in case no similar structures were encountered during the season. The discovery of Site 13 obviated this.

The floor of the pit house was 130 centimeters beneath present ground surface which seemed to be about 10 to 15 centimeters above the ground surface as it was when the house was in use. All of the outer wall not destroyed in the construction of the later kiva was cleared. In addition the southern end was partially cleared. The house was the largest structure found on Alkali Ridge. It was slightly larger than Pit House B at Site 13. The opening for a passage, K, was found in the center of the south wall, but it was not excavated further. It presumably led to a southern antechamber as did similar openings in the Site 13 pit houses. For an understanding of this building, as it probably was, it is suggested that the reader consult the ground plans of Site 13 pit houses to be found farther on in this report. The only floor features uncovered were 2 upright slabs, J, which, from their positions, appear to have been part of the partition wall characteristic of San Juan pit houses.

In the exploratory trench along the southeast wall, 20 centimeters below the surface, a fireplace was found resting upon the fill in the pit house. It had been slab lined and three of the slabs were still in place. They were approximately 8 centimeters thick, 15 to 20 centimeters high, and 15 to 25 centimeters long. They showed definite evidence of fire, as did the bottom of the fireplace. From accompanying potsherds and the relationship of the fireplace to the old pit house it can be assumed that it was used by the occupants of the stone house.

Refuse Mound. The refuse mound presumably associated with the stone house lay in normal position to the southeast of the kiva. It was small and shallow, approximately 8 meters across and not over 20 centimeters deep at the thickest point. The sherds could almost all be classed as Pueblo II with the exception of 6 which might be classified as Pueblo I La Plata Black-on-red. This mound had more black-on-red

²⁰ For discussion of ventilator development, see pp. 208-09.

sherds than any other Pueblo II or Pueblo III refuse mound examined on Alkali Ridge. Almost 5% of the decorated sherds were black-on-red.

Burial in Kiva Fill

Age: child.

Depth: skull 104 centimeters below the present surface.

Condition: skull crushed and fragmentary.

Orientation: head to southwest.

Position: fig. 46, *n*; flexed to right; torso supine; face to right. Right forearm bent inwards over pelvic region, left forearm probably extended along left side.

Peabody Museum catalogue no. N/916.

Associated finds: black-on-white bowl (fig. 69, *a*); one-half black-on-white bowl with indented corrugated exterior (figs. 73, *c*; 151, *c*); part of jar, plain corrugation with indented corrugation in triangular pattern; bone awl. The pottery was all to the left of the torso. The awl was lying across the cervical vertebrae below the skull.

Taxonomic Position of Site 7

PECOS CLASSIFICATION. Basket Maker III, Pueblo I, and Pueblo II periods.

GILA PUEBLO SYSTEM. La Plata, Abajo, and Mancos Mesa Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino, Abajo, Ackmen, and Mancos Foci.

SITE 8 (ABAJO: 7: 8)

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 68, *a*; 111, *c*, *j*, *m*, *q*; 113, *k*; 152, *d*; 153, *c*.

Potsherds: figs. 115, *k*, *l*; 117, *g*; 122, *g*, *b*, *i*; 123, *a*; 124, *b*, *f*; 125, *a*; 126, *f*; 127, *b*, *e*; 129, *i*, *j*; 130, *p*; 133, *b*; 135, *l*; 137, *f*; 138, *j*; 140, *g*; 142, *e*; 143, *t*; 145, *d*; 147, *i*, *k*; 148, *j*; 150, *b*, *f*, *g*; 151, *k*; 160, *b*, *e*; 161, *e*, *g*, *l-n*; 163, *i*.

Drawings of pottery designs: figs. 68, *a*; 70, *f*; 72, *d*.

Objects of stone: fig. 171, *i*.

Objects of bone: figs. 182, *b*; 186, *b*.

ILLUSTRATIONS OF BURIALS AND SKELETAL MATERIAL.

Figs. 190, *d-e'*; 192, *l*.

Site 8, situated less than a mile northwest of Camp 2, proved very disappointing. A shallow but virtually undisturbed refuse mound with definite Pueblo II surface indications gave promise of a valuable site. The only remains of habitation found, however, was an irregular fragment of stone wall. No post holes were discovered and no kiva.

After what seemed to be a reasonable amount of excavation and testing had drawn a blank, the site was abandoned even though the refuse mound was producing well. The refuse mound was left unfinished in conformance with expedition policy that, however lucrative such a mound might be, its contents have relatively little scientific value unless associated with other cultural features.

Before conclusion of the work 4 2-meter squares had been excavated in the refuse

mound. The maximum depth was 48 centimeters. Two flexed burials were found. One was buried with 3 pottery vessels and a bone flesher, the other with 4 vessels and a bone awl. Every potsherd found in this refuse mound could be classified as Pueblo II.

Burials

BURIAL 1. Male. Age: 50-55.

Photographs: figs. 190, *d*, *d'*; 192, *l*.

Condition: disturbed by burrowing animal; except for right forearm, the arms and upper part of torso missing. Also tree root through upper torso.

Orientation: head to southeast.

Position: fig. 46, *o*; flexed to left; torso supine; face to left. Right arm extended at right side.

Cranial deformation: lambdoidal flattening.

Peabody Museum catalogue no. N/917.

Measurements, indices, and observations: see pages 317-21.

Pathology and anomaly: see page 327.

Associated finds: Pot 1, small corrugated jar (fig. 152, *d*) to left of upper torso; Pot 2, black-on-white ladle (fig. 72, *d*) to left of shoulder; Pot 3, black-on-white seed bowl (fig. 111, *c*) in cervical region below skull; Pot 4, black-on-white bowl (figs. 70, *f*; 111, *q*; 113, *k*) at feet, feet actually in the bowl which was placed on edge; bone scraper (fig. 186, *b*) to right of upper torso.

BURIAL 2. Female. Age: 21-35.

Photographs: fig. 190, *e*, *e'*.

Depth: in oblong pit; floor of pit 1 meter below present surface of the mound.

Condition: disturbed by burrowing animal, which removed upper torso and displaced skull, and by tree roots throughout. Skull found, base up, about 30

centimeters to the left of and the same distance higher than its normal position.

Orientation: head to northeast.

Position: fig. 46, *p*; flexed to left; torso on left side; head disturbed. Right forearm bent across pelvis, left forearm missing.

Cranial deformation: lambdoidal flattening.

Peabody Museum catalogue no. N/918.

Measurements, indices, and observations: see pages 322-23.

Pathology and anomaly: see page 327.

Associated finds: Pot 1, black-on-white pitcher

with T-shaped hole in handle (fig. 111, *m*) to left of upper torso; Pot 2, incised corrugated jar, plain and indented corrugations (fig. 153, *c*) to left of pelvis; Pot 3, scattered fragments of large black-on-white water jar (fig. 68, *a*) between Pot 2 and pelvis, at knees, and at feet; bone awl, found in 2 parts, one near Pot 1, the other under the disturbed skull.

Taxonomic Position of Site 8

PECOS CLASSIFICATION. Pueblo II period.

GILA PUEBLO SYSTEM. Mancos Mesa Phase.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Mancos Focus.

SITE 9 (ABAJO: 7: 9)

MAPS AND PLANS. Figs. 18, 19.

PHOTOGRAPH. Fig. 86, *d*.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 112, *b*; 152, *g*, *k*, *l*.

Potsherds: figs. 101, *z*; 115, *a*; 117, *e*; 119, *d*; 120, *d*; 124, *d*, *e*; 125, *c*; 126, *c*, *d*, *g-k*; 127, *g*; 129, *g*, *l*; 131, *j*, *n*; 134, *a*, *c*, *g*; 135, *b*, *c*, *e*; 136, *c*, *d*, *i*; 138, *o*; 140, *l*; 141, *e*, *m*; 144, *l*; 148, *b*; 149, *a*, *b*; 154, *c*; 158, *d*, *f*; 162, *i*; 163, *j*.

Objects of stone: fig. 48, *o*.

By mid-season in 1933 findings at 4 sites, 2, 3, 5, and 7, indicated the presence of jacal structures on Alkali Ridge in association with pottery classifiable as Pueblo II. With the exception of the original test digging near Site 7, all of these occurrences had been associated with coursed-masonry buildings in such a way that conclusive evidence of relative age was not obtained. The weight of evidence at Sites 2, 3, and 5 suggested that the jacals were earlier, and this conformed to archaeological theory and to Roberts findings in the Piedra region.²¹ To clarify this problem, on Alkali Ridge, it seemed necessary to determine whether or not "pure" jacal sites ever existed on the mesa. Then, should they be discovered and the surface indications learned, it would be profitable to continue the search for sites in which the 2 house types might occur in stratigraphic relationship.

Reconnaissance to this end had located a number of sites where large building stones were missing on the surface and where the potsherds seemed earlier than at the units al-

ready excavated, mainly because of a high occurrence of exuberant corrugation. One of these was Site 8, which proved unsatisfactory. Slightly closer to Camp 2, on the south side of the road, was a site which presented an appearance, on the surface, different from any yet encountered. There was a small undisturbed refuse mound with the desired indications in the potsherds, a flat open space which might or might not cover a kiva, and 2 low elongated house mounds with a juniper tree growing in the center of one of them. The longer of the two showed decided effects of fire in the form of burned chunks of adobe mud, some with impressions of poles, and burned pieces of sandstone. The surfaces of both mounds were littered with small stones, which seemed to contradict the possibility of jacal walls yet which were much too small to have formed coursed-masonry walls of the familiar type. Apparently a new house type of some sort had been discovered and excavation was begun.

House. A trench across the site from north to south revealed a kiva and, in the mound due north of the kiva, a house wall. The only feature of the latter remaining *in situ* was post holes in the ground which formed a rectangular pattern as shown on the plan, figure 18, Room A. This room had not burned and the floor, only 7 to 10 centimeters beneath the surface, was hard to follow. On the other hand, the wall was easily traced when the posts were once discovered. Posts of an average diameter of 6 centimeters were set in the ground to a depth of 8 to 18 centimeters. They were 10 to 20 centimeters apart. Since this building had not burned, the usual charred posts were not encountered. Each hole was filled with powdery brown decayed wood. An occasional un-

²¹ Roberts, 1930, and pp. 220-22, herein.

decayed piece was found sufficiently large to show that the poles had been of juniper.

With this encouraging forecast excavation of the larger mound northwest of the flat area was begun. In the center of the mound Room B was discovered. This room had been destroyed by fire and had, in

As in Room A, cedar posts were set into the ground at varying intervals, generally 15 to 20 centimeters apart, sometimes more, sometimes less. At the eastern corner of the south-east wall 4 posts occurred within a distance of only 28 centimeters. In neither of the rooms were the posts at the corners of larger

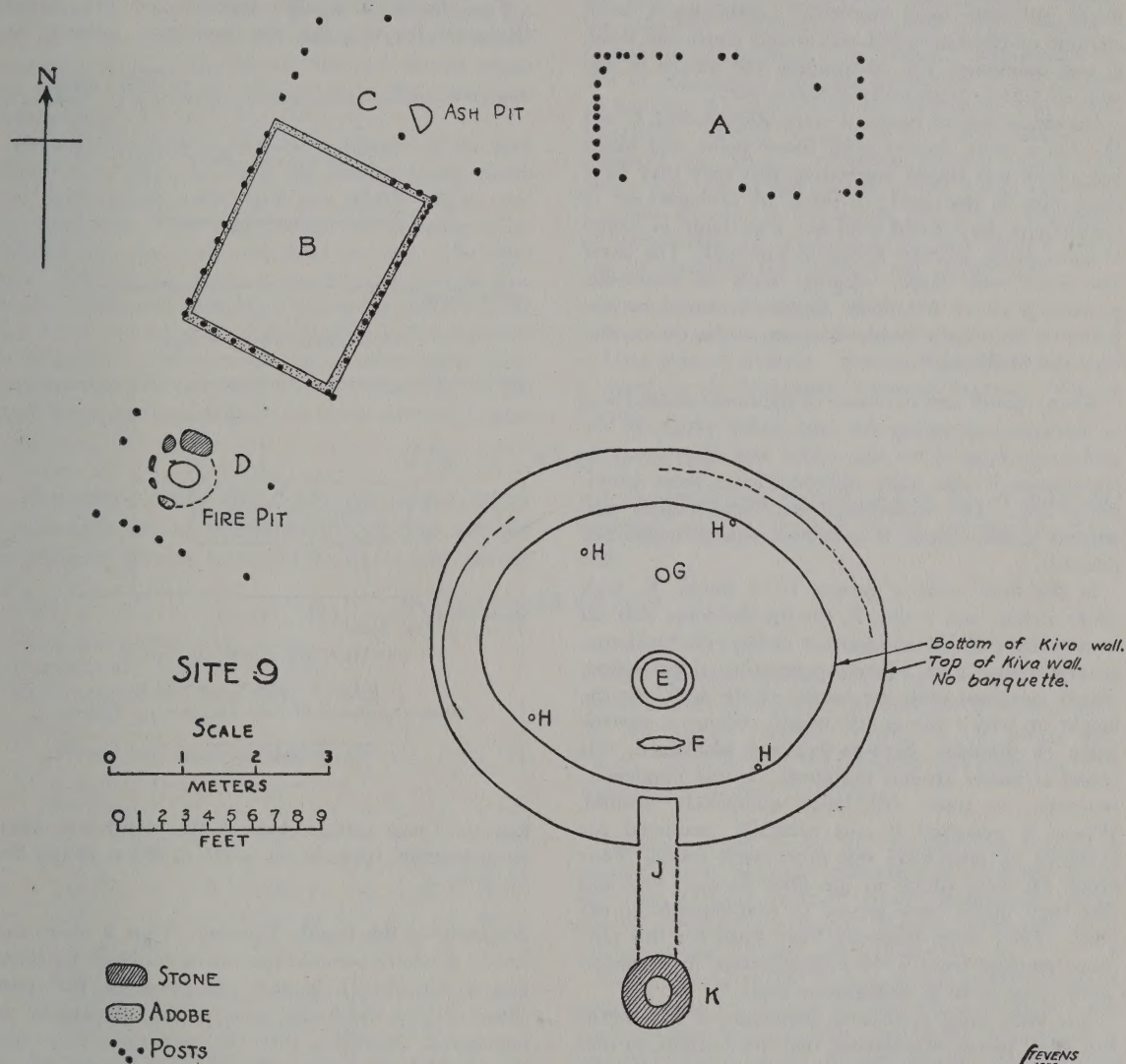


FIG. 18. Ground plan of Site 9, Alkali Ridge.

addition, been protected from erosion by a large juniper which had grown up in its center. Thus, although the large roots had pierced what little remained of the lower part of the walls and had brought about considerable destruction, they had, at the same time, prevented the complete washing away of the adobe with which the posts had been covered, and some meager evidence of wall construction was preserved.

diameter than elsewhere in the walls, nor was there any evidence of posts inside the rooms supporting the roof. The average diameter of the posts was 6 centimeters. The walls between and around the posts were made of adobe mud admixed with small poles, twigs, and small pieces of sandstone. The discovery of the fragments of sandstone imbedded in the adobe between the posts explained the occurrence of large numbers of small stones found on and beneath the

surface of the mound. Although not all of the posts had been burned, the charred remains of most of them were found extending in some cases as much as 10 centimeters above the surface. Inside the room were the crushed remains of several Pueblo II type jars, of which 2 large corrugated jars and a black-on-white jar have been restored.²² Although a small amount of charred wood was found above the floor, it was insufficient for determining the nature of the roof of which presumably it was a part.

On either side of Room B were other rooms, C and D. These were shorter with fewer poles, and much less adobe was found, suggesting that they may have been more in the nature of sheds. A D-shaped pit 12 centimeters deep, filled with ash, was found in Room C and a large, circular firepit in Room D. The latter was lined with large, irregular slabs of sandstone, projecting above the floor. Sherds occurred on the floors of both these rooms but not to the extent that they did in Room B.

Kiva. South and southeast of the house mound was an unnatural-appearing flat area under which, in the initial trenching of the site, a kiva was discovered. In appearance it was quite different from those previously dug. The excavation was bowl-shaped, and entirely earth-walled. It contained neither bench nor pilasters.

In the floor were a sipapu, G; a firepit, E, with adobe collar; and a slot, F, for the deflector slab, all in standard position and perfect order. The wall rose from the floor with a barely perceptible slope at first, which increased with the height of the wall. At the height at which the bench usually occurs a narrow ledge or shoulder, hard-packed and blackened, was found at places around the circle. It was impossible, however, to trace this ledge completely around. Where it occurred it was carefully examined for evidence of post holes but none were found. Four holes, H, were found in the floor in such positions that they might have served as roof-support corner posts. They were, however, very small for this purpose, ranging from 5 to 8 centimeters in diameter. They were 20 to 30 centimeters deep.

The kiva, filled with earth containing a few sherds and small pieces of charcoal, had not burned, so that nothing of the super-structure remained to suggest the method of roof construction. It is possible that the roof of this kiva was of the same type as that postulated by Roberts at "the B village" in the Piedra district of southwestern Colorado. The kiva at B village lacked a bench and had 4 corner posts set into the floor. Between the wall and the main beams supported by the corner posts, Roberts suggests slanting poles set into a shoulder at an angle.²³ Failure to find

pole holes in the shoulder at Site 9 does not necessarily rule out this possibility, as the poles might well have rested upon the shoulder. If such were the case, they would in all probability have been braced in some fashion but need not have been inserted into the earth.

The Piedra kiva also accompanied post houses (Roberts' B-type) but the associated pottery was

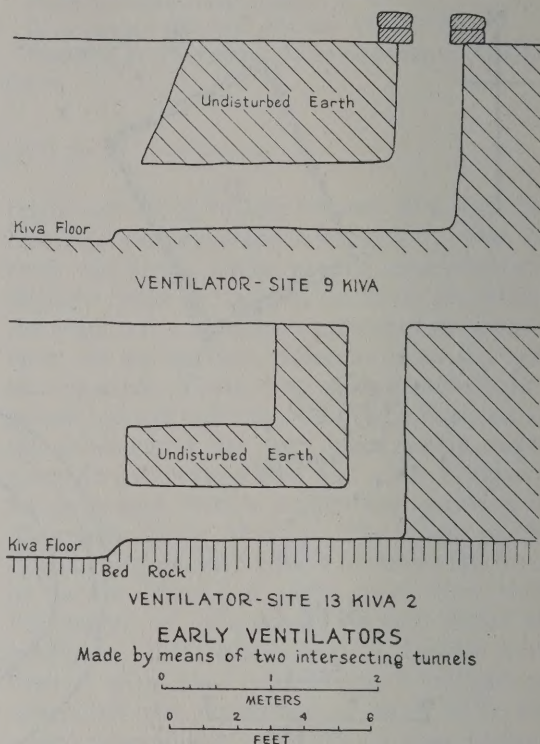


FIG. 19. Cross section through the ventilators, intersecting-tunnel type, in the kivas at Site 9 and at Site 13, Unit 2.

definitely of the Pueblo I period. Thus it seems that at Site 9 where ceramic specimens could all be classified as Pueblo II, pottery development had gone ahead of kiva and house construction. It must be remembered, however, that the post-and-adobe construction of the houses differed from that of "the B village" on the Piedra both in the method of installing posts and in the nature of the wall between the posts.

The firepit, E, was deeper than usual in the Alkali Ridge kivas, with a maximum depth of 34 centimeters. There was the remnant of an adobe collar, well worn down. The bottom was bowl-shaped. Hole G, which might have been a sipapu, was 26 centimeters deep. The slot, F, in which a deflector slab was probably

²² Figs. 112, b; 152, k, l.

²³ Roberts, 1930, p. 44, fig. 9.

set at one time, measured 14 centimeters below floor level at its deepest point.

The ventilator of the Site 9 kiva was of the simplest kind, 2 intersecting tunnels.²⁴ At the opening of the horizontal shaft into the kiva the floor of the shaft was 15 centimeters higher than the kiva floor. The difference in level is shown in the cross section, figure 19. In the same figure a cross section of a similar ventilator at the Unit 2 kiva at Site 13 is shown where the height of the shaft opening above floor level was even greater.

Before leaving Site 9, 1 further feature of the kiva should be mentioned. It is the sort of thing which may seem unimportant now but which might very possibly come to have significance as evidence accumulates and more and more sites are dug. The only stone work in the whole kiva (if we except the deflector which was probably a sandstone slab) was the rim, K, of the opening of the vertical ventilator shaft at the surface of the ground. In all other cases where coursed masonry has been found at the top of the shaft it has been rectangular in form above a rectan-

gular shaft. In this case the stone wall was circular and the shaft cylindrical.

Refuse Mound. The refuse mound on the slope east of Room A was excavated completely. It had been recently bisected by the head of a small gully, but there was no evidence of "pot-hunting." Despite the relatively undisturbed condition of this mound it contained no burials. The possible significance of this in connection with the beginning of the custom of burying the dead in refuse mounds is worth consideration. As will be seen, at the Basket Maker III-Pueblo I site, Ab:7:13, no refuse mounds were found. Site 9 was one of the earliest of the Alkali sites with a refuse mound. It is possible that at the beginning of the practice of dumping refuse in a mound southeast of the house burials were not placed in it.

Taxonomic Position of Site 9

PECOS CLASSIFICATION. Pueblo II period.

GILA PUEBLO SYSTEM. Mancos Mesa Phase.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Mancos Focus.

SITE 10 (ABAJO: 7: 10)

The area marked Site 10 on the map (fig. 3) is a locality which presented promising surface indications similar to those of Site 9 but which

upon actual testing seemed to be of such indefinite nature as not to be worth working out.

SITE 11 (ABAJO: 7: 11)

MAPS AND PLANS. Figs. 20-22.

PHOTOGRAPHS. Figs. 87; 88, a, b.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 111, l, w; 112, a, c, e; 153, j.

Potsherds: figs. 101, cc; 115, g, b; 117, f; 118, b, c; 119, c, e, g; 120, i; 121, a, b; 124, c; 125, b, f, g; 126, e; 127, j, k; 128, a; 131, e, g, l, m, p; 135, a; 139, c, k, o; 141, i; 143, b-d, k, m, u; 144, b, j; 147, g; 148, g; 149, b, e, g, i; 150, m, o; 157, d; 160, d, f, l; 162, g, m; 163, b, d, e, k, l; 164, b.

Drawings of pottery designs: figs. 71, d, f; 76, g.

Miscellaneous clay objects: fig. 175, e.

Objects of stone: figs. 47, f-h, k; 48, f; 49, m; 171, b, d; 172, i, k, l, m; 175, i, k.

Objects of bone: figs. 176, a; 182, d; 183, a, d; 184, d; 186, c.

The successful conclusion at Site 9 of the search for a pure jacal advanced the expedition to its next stage, the discovery of jacal and stone-masonry houses in stratigraphic relationship. At Site 11, slightly more than half a mile

south of Camp 2 a house mound was found with the same surface indications as at Site 9, small stones and pieces of burned adobe, many of the latter bearing imprints of poles and twigs. In addition there were the remains of 2 coursed-masonry buildings.

Houses. Here, in the first attempt, the expedition uncovered the necessary stratigraphic evidence showing that coursed-masonry houses superseded jacals during the period generally known as Pueblo II, a discovery later to be confirmed at Site 12.

Partly owing to the fact that the larger of the 2 coursed-masonry houses, A, was set in what had apparently been an important part of the jacal house, it was impossible to trace the ground plan of the earlier structure. However, a sufficient number of post holes and other remains were found to establish the fact that such a house had been there.

Lumps of adobe were first noticed lying on the surface on the part of the mound stretching westward from the obvious remains of Stone House A. These adobe lumps were similar to those found at Site 9, and therefore especial care was taken that no posts be overlooked as the area was excavated. The fill, in

²⁴For discussion of ventilator development, see pp. 208-09.

places more than 50 centimeters deep, of mixed earth, adobe, burned wood, and large numbers of potsherds, was much greater than at Site 9 or at Site 12, the other post house sites.

A study of the adobe lumps resulted in many discoveries. The wall adobe apparently contained fewer stones than at Site 9 but showed fully as high a percentage of twigs, small poles, etc. Potsherds as well as small stones had been imbedded in the adobe be-

coal, and pottery mixture at no place abutted the stone wall. The pile of debris came to within 3 to 15 centimeters of the wall; the remaining space was filled with loose earth. The same phenomenon occurred along the north and east walls, though the adobe debris was much less deep. The explanation is that the stone house was built in an excavation in the center of the mound made by the collapse of the post-and-adobe house. The reason that the accumula-

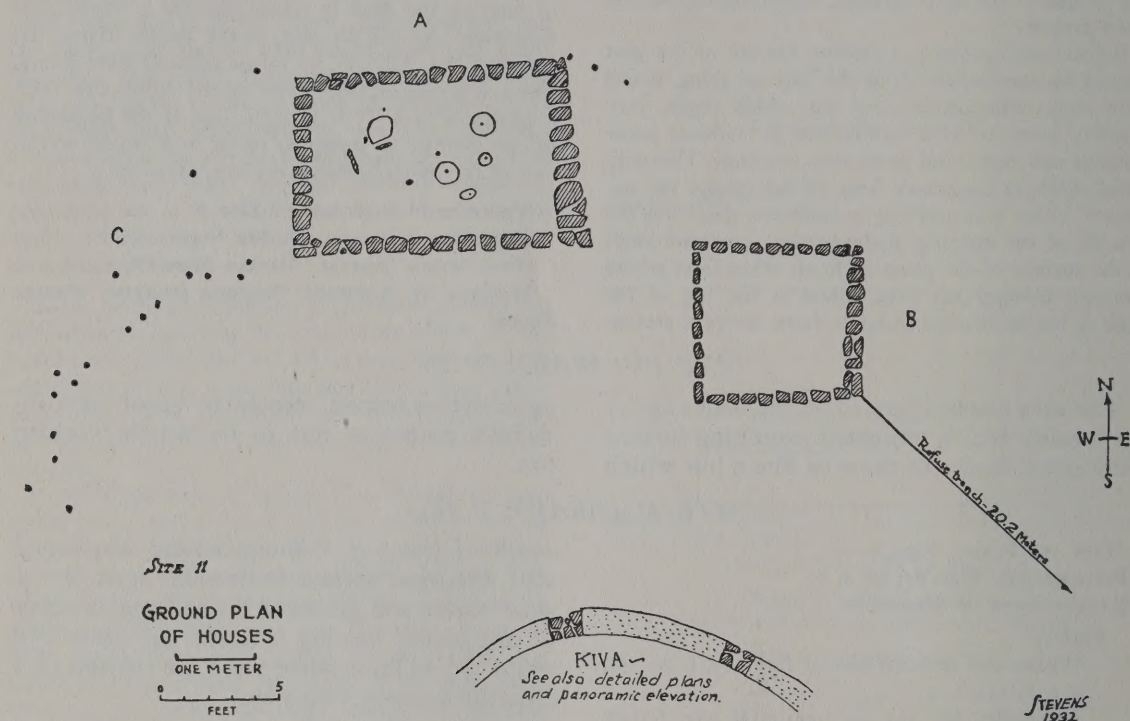


FIG. 20. Ground plan of house area, Site 11, Alkali Ridge.

tween the posts. Imprints of split timbers were found, probably indicating pieces from the ceiling.

Most interesting were a number of lumps with flat surfaces decorated with incised lines. The incisions, made with a sharp pointed or edged tool were from 2 to 7.5 millimeters deep. They were arranged in parallel straight lines about 4 centimeters apart and crossed at longer intervals by other lines running at right angles to them. These lumps were probably from the walls. Certainly they were not from the top of the roof, for the edges of the incisions showed no signs of wear. One lump was found which probably did come from the top. It bore the imprint of the right foot of a child. The urge felt by modern city urchins to tread on hardening concrete apparently was not unknown to the Pueblo infant.

As the western end of Room A, the main stone house, was approached, the mass of debris deepened to over 50 centimeters. The reason for this appeared when the wall was reached. The adobe, earth, char-

tion of debris was so great to the west of House A was that most of the material removed in the excavation had been thrown in that direction.

The discovery of post holes and small pits under the floor of House A was further evidence that the stone house had been built after the destruction of the jacal. The arrangement of post holes here would not be sufficient in itself to prove the one-time presence of a jacal. However, the chunks of burned adobe, many of them showing impressions of large and small poles and even of withes, found in the debris, taken in conjunction with subsequent findings at Site 12 satisfactorily established the presence of post-and-adobe rooms. It should be noted as well that the potsherds found in the jacal region, in the debris and upon the floor level, represent the earliest phase of so-called Pueblo II and provide a few examples of Pueblo I wares including sherds of Abajo Red-on-orange.

The 2 single-room stone houses at Site 11 were

good examples of the Pueblo II coursed-masonry houses (fig. 20). The largest, A, was built, as has been noted above, in an excavation in the debris mound of a burned jacal structure. Two floor levels were encountered during excavation, the lower one presumably associated with the earlier jacal building, as it was lower than the base of the walls and ran under them. The upper floor was 58 centimeters below the highest standing part of the north wall, and the lower floor was 25 to 30 centimeters below this. The slabs, post holes, and pits, the last filled with ash, shown in figure 20 were all in the lower floor. No firepits were found in the upper floor level, which was the one accompanying the stone walls.

House B, almost a true square, was much smaller and probably served as a granary. No firepit or any other remains of functional features were found inside it.

To the north and northeast of the excavated house a large area was uncovered which showed extensive signs of use. Many potsherds were found on an "occupational level." Two slab-lined firepits were uncovered, as well as a larger ash pit and a pile of stones, but no definite evidence of house structures was encountered.

Kiva. The kiva at Site 11 was one of the most important uncovered by the excavation. A single building had served as kiva throughout the occupation of the site, and during that time a number of architectural revisions had been made. Its final form was in part a close approximation to the standard Mesa Verde kiva. Its original form embodied features until now known only in the earlier "pit house." All of this did not become clear until after the excavation of Site 12. At that site (see pp. 149-51), which had an approximately identical time-span, 2 kivas were found, one associated with the jacal house, the other with the coursed-masonry house. At Site 11, instead of building a new "modern" kiva, the inhabitants had revised the old one.

Aside from its great importance in the developmental sequence of kiva architecture, the Site 11 kiva was remarkable in other ways. It was 4.56 meters in diameter, the largest encountered on Alkali Ridge, and it had 8 pilasters instead of the usual 6.

During excavation, before the floor had been reached, it was found that the plaster covering the earthen walls still retained traces of paint with which it had been decorated. At one place, on the north wall, the design could be determined. Three diagonal bars of white paint, 4 centimeters wide, were clearly discernible. Slighter traces here and there about the wall indicated that the diagonal stripes had run all around the kiva (fig. 87, *b, d*). The distance between bars was measurable only in the group which has just

been mentioned. In one case it was 9 centimeters, in the other 12 centimeters.

This had not been the first painted decoration of the kiva walls. The stripes were merely the top coat, which had been visible when use of the kiva was discontinued. The plaster upon which they were painted ranged from 1 to 3 millimeters in thickness. Under the top coat was another coat of plaster, also decorated with white paint. To determine the design on the under coat was impossible. The paint visible on the extreme right of figure 87, *b* is on the under coat. A discussion of Pueblo kiva painting will be found on page 212.

Other phenomena encountered during the removal of the fill testified to the unusual nature of the kiva, but it was not until the floor was cleared that the presence of its most extraordinary feature was suspected. Peculiar irregularities in the hard-packed, blackened floor were observed while it was being cleaned off. It appeared to have settled in places, making it uneven, and it was full of cracks which obviously had occurred subsequent to its continuous use as a floor, for the edges of the cracks had not been broken or at all worn.

As soon as the floor could be viewed in its entirety, the irregularities assumed a definite pattern. The circle was divided into 5 pie-shaped sunken sections, separated by 5 sets of 2 narrow parallel ridges with a sunken trough about 20 centimeters wide between them, all converging on the large, slab-lined central firepit (fig. 21). From the nature of the floor it was evident that settling had taken place and that the high sections had been kept from sinking presumably because of some sort of structure underneath.

Evidence of the character of the under-structure was obtained from a sipapu, G, east of the firepit. When discovered it presented the appearance of a miniature volcano standing in one of the sunken pie-shaped areas referred to above. The hole was full of yellow sand and, when this had been removed, small sandstone slabs were found lining the walls. From this it was inferred that the other high sections of the floor were also being held up by stones.

Removal of the floor revealed a series of 5 pairs of walls 15 to 20 centimeters high radiating from the outer rim of the firepit and running to the kiva wall (fig. 21). Thus 5 channels were formed. Remains of the ends of small wooden poles which had been placed across these channels showed that they had been roofed. Except for the northern set, the walls were neither truly parallel nor straight. The stones of which they were made were but crudely shaped, some not at all. Apparently care had been taken only to have the inner sides of the walls, that is the channel side, straight and smooth. Some of the stones were very large, running up to 60 by 30 centimeters by 20 centimeters high. The channels varied from 12 to 40 centimeters in width.

SITE II - KIVA

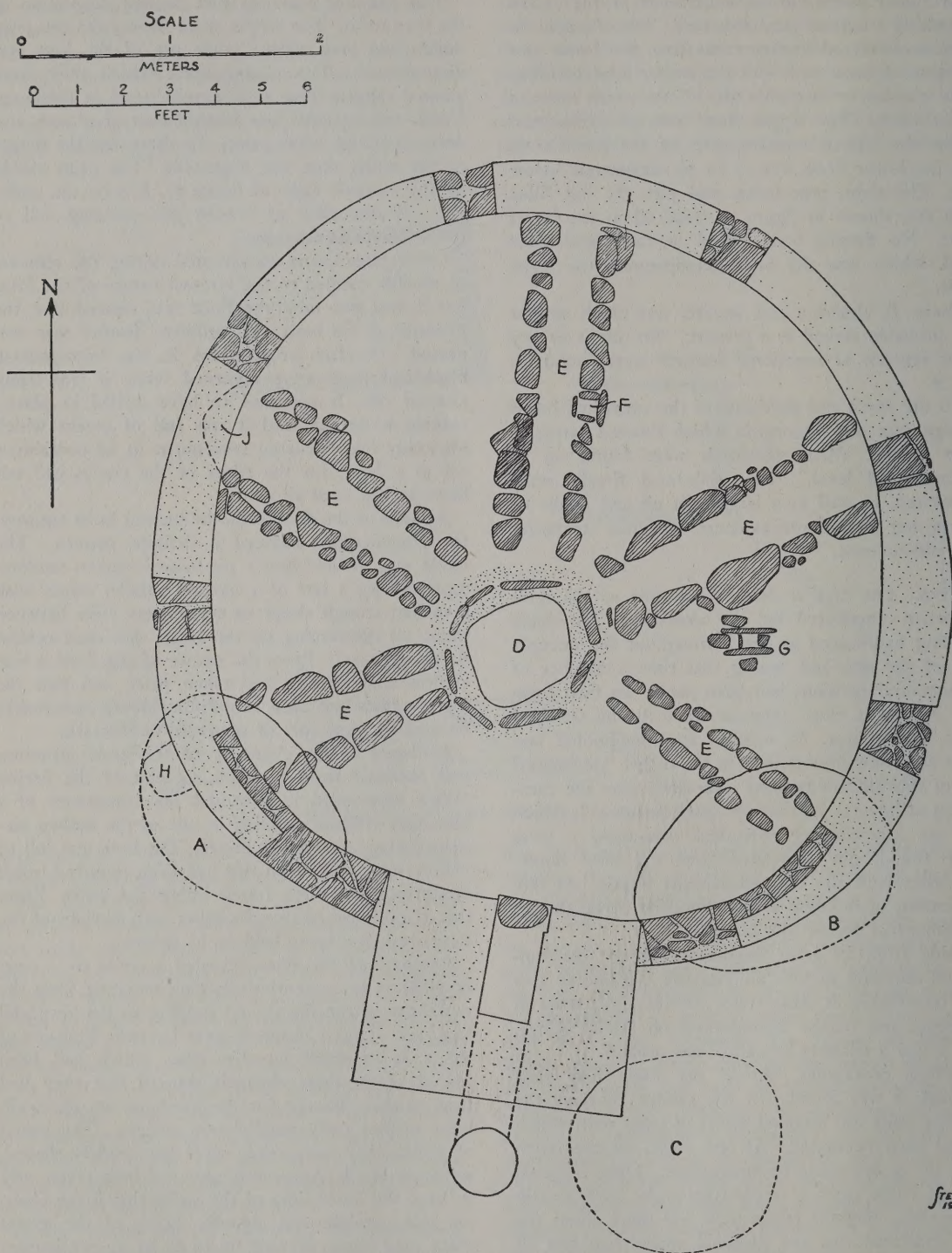
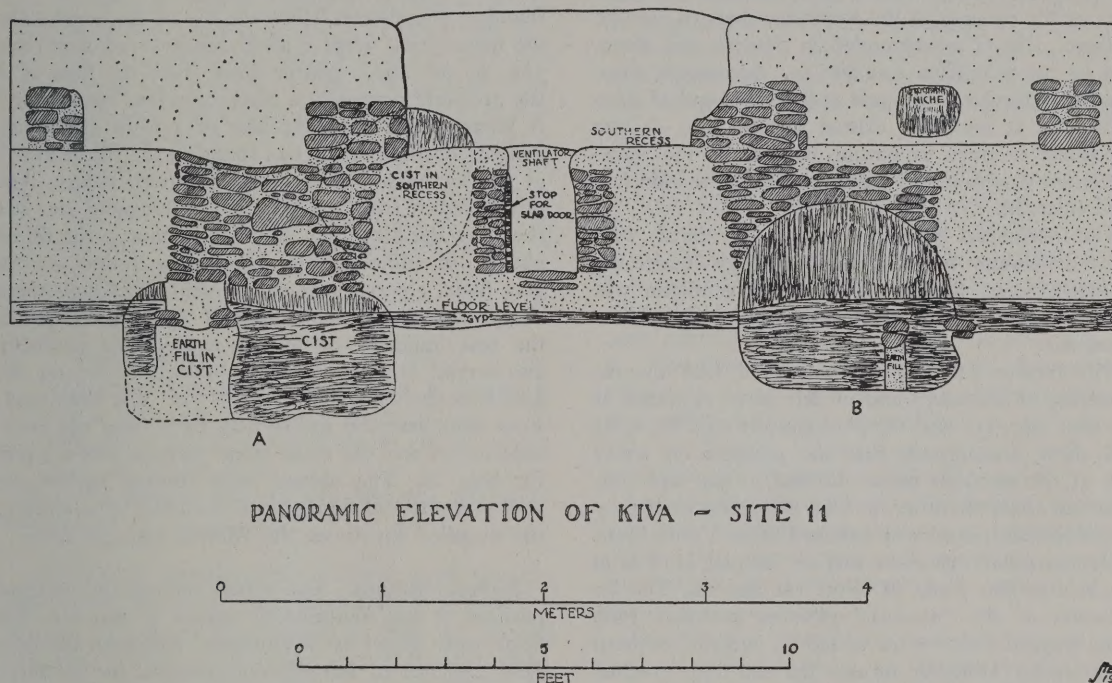


FIG. 21. Ground plan of the kiva, Site 11, Alkali Ridge, showing the channels underneath the floor.

The inner ends of the walls abutted the thick earthen collar of the firepit. Through this collar at the end of each channel was a tunnel slanting slightly upward. When the kiva was excavated by the expedition, large slabs with which the firepit was lined blocked off these tunnels. But with the slabs removed direct connection was established between the firepit and the channels. This circumstance is our only clue

merely as a surmise of a possible usefulness which this unusual system of walls might have fulfilled.

In the eastern member of the northern set of walls was a sipapu (fig. 21, F) set into the wall and made in exactly the same manner as the one to the east of the firepit. The slab forming the south side of the box was an old, worn mano. Like the other sipapu it contained yellow sand, but it was covered by the floor at



PANORAMIC ELEVATION OF KIVA - SITE 11

FIG. 22. Panoramic elevation of the southern half of the kiva, Site 11, Alkali Ridge, showing channel walls built on fill in old cists and the cist in the southeastern corner of the southern recess.

to possible functional use of the channels, provided they were not of purely ceremonial significance. Considerable draught could have been created through them. If such was their use, the question of the source of the air current arises. At the outer end the walls came directly against undisturbed earth, except in 2 cases where they terminated in filled-in cists. That these cists were not a part of the radiating wall system and that they had been filled in before the walls were built was established beyond doubt, because parts of the radiating walls were actually built on back fill within the cists (fig. 88, b). Furthermore, no evidence of vertical shafts at the outer ends of the channels was found. The only other possible source of air would have been small holes in the floor through the roofs of the channels. No such holes were found. The above discussion is advanced

the time of excavation and had apparently been disused for a time before the kiva was abandoned.

The unevenness of the floor when uncovered is now explained. After the channels had been built, the spaces between were filled and the channels themselves covered. At the time of discovery the thickness of hard-packed earth above the channel walls was 15 centimeters. Absence of holes and other evidence of use and the undisturbed earth at the base of the central firepit seem conclusive evidence that the level upon which these walls were built was never used as a floor.

Another unusual group of features came to light in the southern part of this kiva, which help to tie it in with the earlier kiva at Site 12. Two large cists in the southeast and southwest walls, extending partly under the floor, had been walled up with rather

crude coursed masonry (cists A and B in figure 22; see also figure 21 and figures 87, *c*, *d*; 88, *a*, *b*).²⁵ A third cist (C in figure 21) was cut into by the southeast corner of the southern recess.

The southern recess, at the time of excavation, was very large; in fact it bore more resemblance to the roomy recess of the standard Mesa Verde kiva than any others found in the early kivas on Alkali Ridge. Upon investigation, however, the bench was found to be made of filled-in earth, with masonry at both sides of the opening of the ventilator shaft to prevent collapse. Cist C corresponded in position and elevation to cist S in Kiva 2 at Site 12. Apparently then, a chamber similar to the one at the south end of Kiva 2, Site 12, at one time existed in this kiva. It was impossible to trace its outline because, in the transformation to a southern recess, the whole section had been enlarged.

The horizontal ventilator shaft was lined with coursed masonry for about half its length under the southern recess. Behind the recess the ventilator was of the intersecting-tunnel variety, part of the original ventilator.

One further anomaly was associated with the remodeling of the south end of this kiva. A glance at the plan (fig. 21) and the photographs (fig. 88, *a*, *b*) will show immediately that the pilasters on either side of the southern recess differed in size and construction from the other 6. Like the recess itself they resembled the pilasters in standard Mesa Verde kivas, while the others were the smaller, simpler kind as in the kiva at Site 7 and in Kiva 1 at Site 12. The installation of the "modern" pilasters probably took place when the cists were walled up and the southern recess built. Whether or not the sub-floor channel system was built at the same time could not be determined. Since parts of 2 of them rested on fill in the cists, we know they were put in after the cists had been abandoned, but this is as far as we can go. The history of modern kivas offers more than one example of extensive remodeling. The most striking instance is perhaps the recent installation of a concrete floor in the Snake kiva at the Hopi Pueblo of Walpi, with a carefully figured pitch to a drain running through the wall to the edge of the cliff.

The evidence presented by this kiva suggests more than one extensive remodeling. The first subterranean building may have been a pit house with cists A and B corresponding to cist M in Pit House H, Site 13 (pp. 178-79). If this was true the situation in the southern recess, with cist C, suggests that the second architectural phase resembled Kiva 2 at Site 12 (pp.

149-50). A third major phase would then be represented by the fully developed southern recess, built on back fill, and by the expanding pilasters. The peculiar sub-floor channels could have been associated with the second or with the early part of the third phase. They certainly were not in use at the time the kiva was abandoned.

Many potsherds were found in the fill of the Site 11 kiva near the floor, as well as much bone and worked stone. A pottery pipe (fig. 175, *e*) was found 45 centimeters below the top of the bench. On the bench itself were a small full-grooved stone axe (fig. 49, *m*) and a platter made from the base of a jar, probably originally a black-on-white "water jar." A platter made from the base of a plain (i.e. undented) corrugated jar was found in the fill of cist C in the southeast corner of the southern recess. Another platter, from the base of a corrugated jar, was found on the kiva floor, and still another in the fill of cist B. In addition 6 jar bases were found on the kiva floor, 5 corrugated and 1 plain. Although these did not show the retouching of the edge which is the best indicator of formal re-use, they probably also served as platters. Other objects found on the kiva floor can be seen in figure 87, *d*. The large sandstone slab near the firepit may have been the roof-hole cover, and the small stone perhaps was a cover for hole G. The oblong stone leaning against the wall at the top of figure 87, *d* resembles typologically the so-called lap stones (see Morris, 1939, pl. 143a).

Refuse Mound. The refuse mound, in standard position at the southeastern corner of the site, had been badly pitted by pot-hunters. Although the one-time presence of burials was indicated by shattered human bones on the surface, they had all been taken out. The bulk of the potsherds showed a range from very early to well-advanced Pueblo II correlating with the evidence of houses and kiva. Although, as at all sites except Site 13, the Basket Maker III and Pueblo I sherds constituted a very small fraction of 1% of the total number, 7. Abajo Red-on-orange sherds were found at Site 11. This number was exceeded only at Site 7, where a Pueblo I pit house was found, and at Site 13, where Abajo Red-on-orange was the predominant decorated pottery type.

Taxonomic Position of Site 11

PECOS CLASSIFICATION. Pueblo II period.

GILA PUEBLO SYSTEM. Mancos Mesa Phase.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Mancos Focus.

²⁵ Niche H, fig. 21, must not be confused with cist A. The former was a small cist cut into the earthen

wall above the bench and was in no way related to A.

SITE 12 (ABAJO: 7: 12)

MAPS AND PLANS. Figs. 23-26.

PHOTOGRAPHS. Figs. 88, *c, d*; 89; 174, *g-i*.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 100, *d*; 111, *r, t-v*; 112, *d*; 113, *f*; 114, *a, b, e*; 152, *a, e, h, o, p*; 153, *b, k*.

Potsherds: figs. 115, *b-e, m, n*; 119, *a, b*; 120, *a, c*; 121, *b, i*; 122, *d*; 124, *g, h*; 128, *f*; 129, *a, c, d, h*; 130, *a-o*; 132, *a-m, o-q, s*; 133, *b, c, e, f, i-l, n*; 134, *b, j*; 135, *k*; 136, *a, b, g, h, j, k*; 137, *a, d, h, i*; 138, *a-c, e, g, i, k, m*; 139, *a, b, d, e, g-j, l-n*; 140, *a-c, e, i, j*; 141, *d, h, n*; 142, *a, b*; 143, *a, g, h, n-p, r, w*; 144, *c, d, h, k*; 145, *b, c, i*; 146; 147, *c, d, j, o*; 148, *a, c, h, l, p, q*; 149, *c, d*; 150, *c, d, i-k*; 151, *e, g, m, r-t*; 154, *b, e, g*; 157, *b*; 158, *a-c, g, j, k*; 160, *c, g-k*; 162, *a, b, e, f, k, l, n*; 163, *f*.

Drawings of pottery designs: figs. 69, *b, f*; 72, *f*; 73, *b*; 77, *o*; 78, *b*.

Miscellaneous clay objects: fig. 151, *l*.

Objects of stone: figs. 47, *a, d*; 48, *g, k*; 170, *b*; 171, *a, c, e, f, h, j*; 174, *d, g-i*; 175, *m*.

Objects of bone: figs. 176, *b, d*; 178, *k, n*; 184, *b, e*; 186, *d*; 187, *d, f*.

ILLUSTRATIONS OF BURIALS AND SKELETAL MATERIAL.
Figs. 190, *f, f'*; 191, *c*; 192, *e*.

Although stratigraphic evidence of the relationship between jacal and coursed-masonry houses had been established at Site 11, it was felt that a clearer example would be desirable. Also, new problems had been presented by the Site 11 kiva. Therefore, Site 12, about a quarter of a mile to the northwest, was excavated. Here the surface indicated a larger and more definite post house area; a 2-room coursed-masonry house, a larger, deeper and less disturbed refuse mound; and 2 kiva depressions, one associated by position with the jacal houses and one directly in front of the stone house. The surface potsherds seemed to cover the same range of crude to well-developed Pueblo II as did those of Site 11.

Excavation confirmed the surface indications, provided much additional information about the jacal houses, revealed a curious overlapping of the use of wood and stone in house walls, and, in the kivas, presented an explanation of the situation in the south end of the kiva at Site 11. Although the Site 11 kiva has been described above, it was not fully understood until after the excavation of Site 12.

HOUSES. The houses lay to the north and west of the kivas. The general situation was very similar to that at Site 11, with a stone house built on the site of previous jacals (fig. 23). The stone house was restricted to 2 rooms. The post house remains were much more extensive. Ten rooms could be identified with reasonable certainty; sporadic posts and single lines of posts may have been parts of others; and, although not so definitely established as at Site 11, it is probable that a jacal originally stood on the site subsequently occupied by the stone house. A third type of structure was a small pit, N, southwest of Kiva 2.

POST HOUSES. The post-walled rooms at Site 12 were more numerous than at any other Pueblo II site excavated by the expedition. Definite remains, either the post hole or part of the post itself, of 184 posts were found, exclusive of 9 posts incorporated in the walls of the stone house. The posts were in some cases considerably larger than any at Sites 7, 9, and 11. The diameters ranged from 2 to 18 centimeters with a maximum variation of 15 centimeters in the same wall. Split posts were found as well, also set into the ground. These varied from a split log 8 centimeters in diameter to lathe-like pieces 4 to 6 by 1 to 2 centimeters, trimmed on both sides. As at Site 9, corner posts did not tend to be larger than the others. The largest post (18 centimeters) and the next largest (17 centimeters) both occurred in the middle sections of walls.

The floors of these rooms were but 10 to 30 centimeters below the surface, yet, despite the shallowness, more information about this sort of wall was obtained than from any of the other sites at which they occurred. For the first time large sections of walls were found with stones, as well as poles, still in place (fig. 88, *d*). Some of these stones were much bigger than any found in the debris at Site 9. The largest, of irregular shape, was 50 centimeters high, 40 centimeters wide at the top, and 15 centimeters thick. Most of them, however, were less than half that size and many corresponded to the small stones characteristic of the surface indications of Site 9. Two sides of Room G, where the fill was deepest, had a stone remaining between every 2 posts. In 2 cases 2 stones remained, 1 on top of the other in the interstices between the posts (fig. 88, *d*). This, if generally characteristic of the walls, would be a rather close approximation to coursed masonry, the courses, however, being broken at regular intervals by the posts. The importance of this will be seen in the description of the stone house at this site. It should be noted here that less adobe was found in the fill than at Site 9, a possible indication that the walls contained a greater proportion of stones.

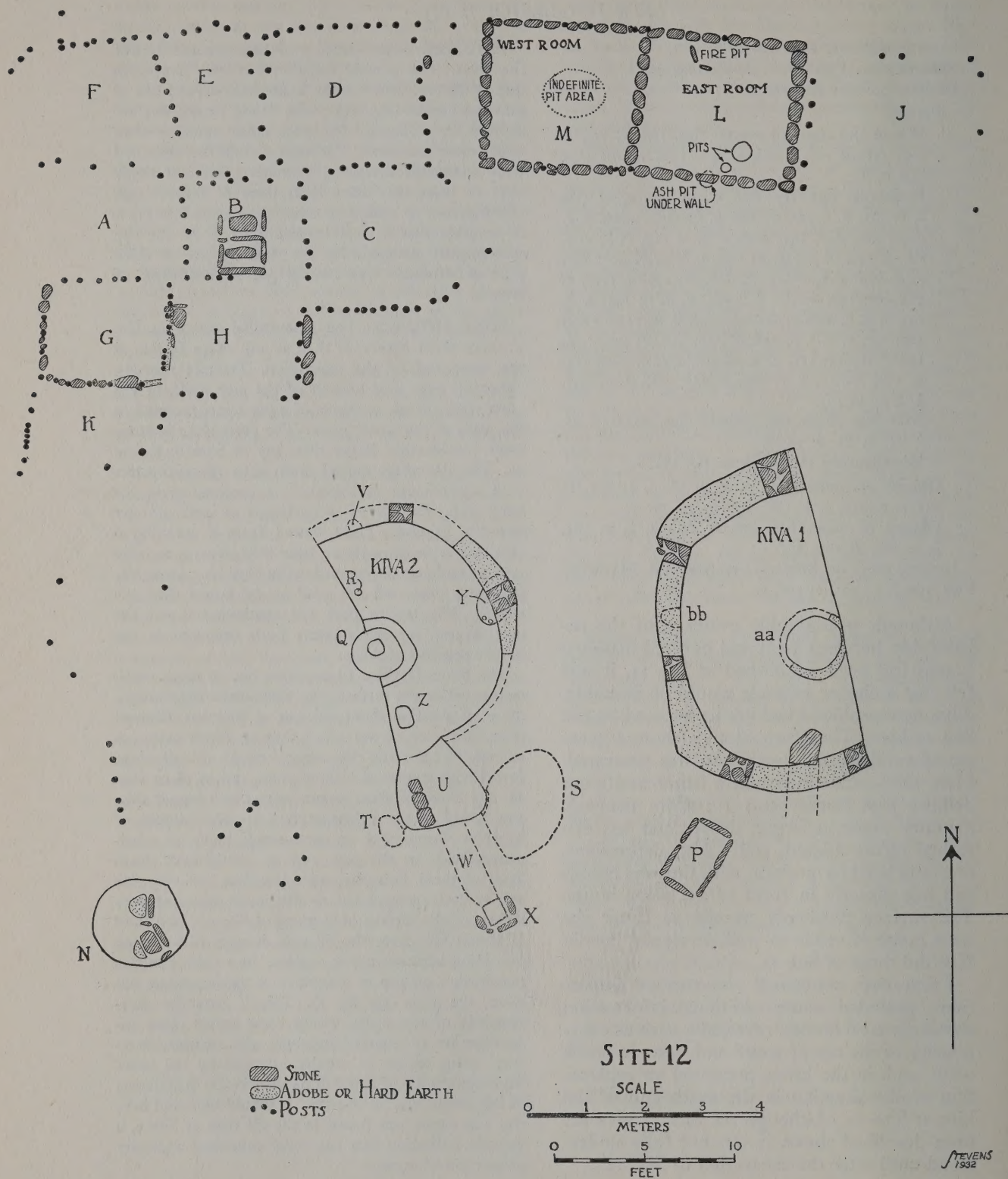


FIG. 23. Ground plan of Site 12, Alkali Ridge.

One of the walls in this series where adobe, as well as posts and stones, remained presented another interesting characteristic. In addition to the stones between the posts, thin irregular stone slabs, 5 to 15

parts of the San Juan).²⁶ The posts obtained their stability by being set into the ground, and the stones rested on the ground at floor level.

The rooms were small, 1.5 to 2.5 meters on a side, and for the most part roughly rectangular. Three of them, C, F, and K, seemed to have had curved walls at one end. The area marked A may not have been a room, at all, since no trace of a west wall was found. The floor, however, was similar to those in the other rooms, and the area might have been roofed over to serve as a partially open shelter. There may have been a west wall, of course, made of materials other than posts of which no trace remained. A similar situation occurred in Room J at the eastern end of the stone house, where no south wall was found.

Including A and J, 10 post houses were found. A glance at the plan (fig. 23) will show possible indications of 3 others south of Room K and west of Kiva 2. Eighteen post holes occurred in this region, and they seemed to form patterns in part. The patterns were too incomplete to be labeled as rooms, and the reader is free to reconstruct them from the plan. They appeared to be remnants of even smaller structures than those to the north of them, and it is possible that they may have been turkey pens.

Two posts were found north of Room F, and the house may have extended farther in that direction. If so, the evidence of it is forever lost, as the area beyond the north row has been eroded and now falls off rapidly into a gully which feeds one of the easterly side-washes of Alkali Canyon. The probability that post houses preceded the 2-room stone house on the site of the latter structure has already been mentioned.

It is impossible to state whether or not all of the post rooms were in use simultaneously. Many of them shared a common wall but this was not true throughout. For example, between Rooms B and E were 2 rows of posts approximately 10 centimeters apart. A similar situation obtained between B and D and, in part, between D and E. These indications suggest that Site 12 shared the common Pueblo building tradition of continual building, revising, abandoning, and tearing down.

Despite their smallness and the total absence of firepits within the walls, the rooms seemed to have performed domiciliary functions. The floors showed abundant use and were littered with potsherds. Further indication of domiciliary use were 3 grinding bins, 2 in Room B and 1 in Room H (figs. 24; 174, g-i). These, though very simple, were surprisingly similar to those found in rooms of Pueblo III and Pueblo IV and even in modern Pueblos. The metates were imbedded in adobe and in one of the bins in Room B a mano was found. These seem to be the

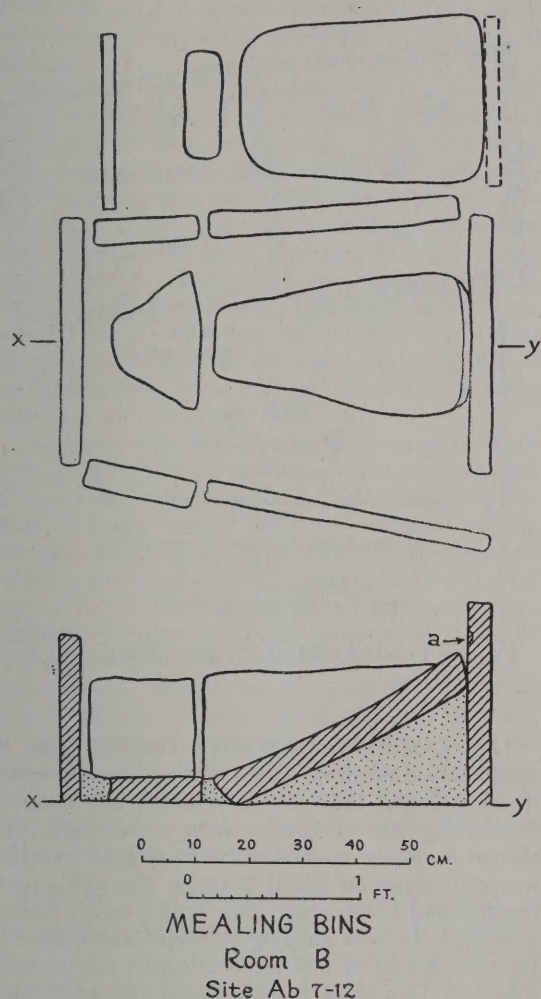


FIG. 24. Ground plan of the mealing bins in Room B, Site 12, and a cross section through one of them.

centimeters in length, were imbedded in the adobe, both parallel to and at right angles to the faces of the walls. They were not a wall facing, as they were for the most part completely covered with adobe.

Although this type of wall will be fully discussed in the section on the development of houses (p. 222), it may be well to emphasize here that these were not pit houses and that the stones were not set in to hold the posts upright in a trench (a custom found in other

²⁶ Morris, 1919a, p. 187 and Roberts, 1930, p. 37.

earliest built-in stone grinding bins yet discovered.²⁷ When Miss Bartlett's paper on Pueblo milling practices was published, the earliest bins reported were from Pueblo III sites.²⁸

The metates in the bins in Room B were of graded fineness as in modern bins, with one for coarse and one for fine grinding. They were not troughed; the entire top surface of the stone was utilized. The angles of the metates with the horizontal were 26 degrees in bin 1 and 33.5 degrees in bin 2. The partition slab between the bins was also set at an angle, 29.5 degrees with the horizontal. The walls of the bins were upright slabs, and the eastern slab of bin 2 had a groove 24 centimeters long and 1 centimeter deep worn in it where the mano struck it at the top of the stroke. Figure 24 shows the ground plan and cross section of the bins in Room B. In all, 18 manos were found on the floors of the post houses. Mealing bins from the La Plata Valley near the Colorado-New Mexico line are shown by Morris.²⁹ Mealing bins in modern Hopi towns are described and illustrated by Victor Mindeleff.³⁰

PIT ROOM. Southwest of Kiva 2 was a small pit room, N, with a floor ca. 120 centimeters below the ground surface (fig. 89, d). The floor was well worn, and on it were 2 slab-lined bins of which one or both may have been grinding pits. The discovery of 1 mano and parts of 3 broken ones in pit 2 suggests a possibility of this. On the other hand, the long axis of the pits ran the wrong way for them to be a pair, in graded series, as those in Room B. Also, bin 1 had a slab floor suggesting use for storage. Four slab-floored basins were found by Morris in a pit room underneath Building XV at La Plata Site 41.³¹

The pit was filled to the surface upon discovery. In the fill was a large quantity of chunks of burned adobe characteristic of post house areas, and the sherds on the floor were similar to those on the floors of the post rooms. Consequently, it is assumed that this pit was contemporaneous with the post house. There is a possibility that the pit intersected by Kiva 1 at Site 5 (p. 126) may have been a similar structure.

The wall as well as the floor was of dirt and, from the large amount of burned adobe in the fill, it may be assumed that some sort of jacal super-structure was present at one time. The adobe could be interpreted, however, as debris from the burning of a post house, deposited in a convenient hole. A large slab, 56 by 40 by 4 centimeters, was found on the floor. The slab was carefully trimmed, almost truly rectangular, and of the kind known to have been used as a door

slab. Whether the entrance was in the roof or in an above-ground section of jacal wall could not be determined. It was certainly not a sub-surface passage or tunnel such as the one in the pit at Site 5, referred to above, in which a similar slab was found.

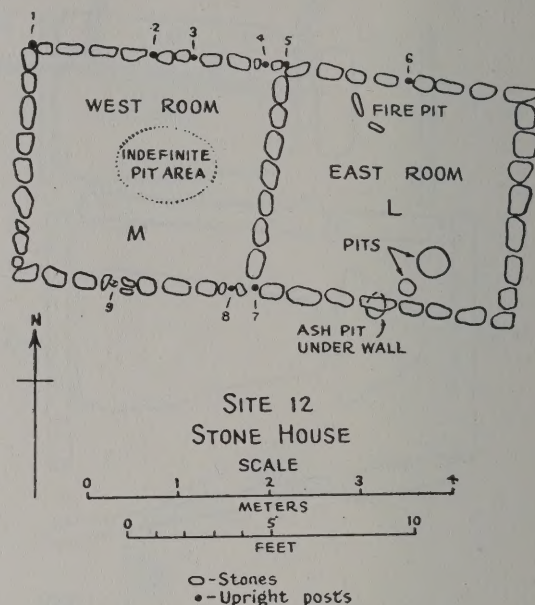


FIG. 25. Ground plan of the stone house, Site 12, Alkali Ridge.

THE COURSED-MASONRY HOUSE. East of Room D and north of Kiva 1 was a 2-room coursed-masonry house. One fact alone makes this house an outstanding one in Southwestern archaeology. Although it closely resembled the usual small coursed-masonry houses on Alkali Ridge, it also had 9 posts incorporated in the walls (figs. 25; 88, c). It seemed as though the wall building technique exemplified in the post houses at this site overlapped into coursed masonry. Two of the posts extended upward through only 2 courses, or approximately 15 centimeters, of the wall; the others came up to at least the height at which the walls stood upon excavation, which was 50 centimeters or 5 to 6 courses of stones. The posts were of the same type as those in the post houses, ranging from 6 to 13 centimeters in diameter, most of them being about 12 centimeters. East of the stone house was another post house, Room J. The floors of the stone house rooms were on the same level as those of the post houses, and the rooms were of the

²⁷ Bartlett, 1933, p. 27.

²⁸ Morris, 1939, plates 57, 85, 86.

²⁹ Mindeleff, 1891, pp. 211-12, figs. 101 and 105

³¹ Morris, 1939, p. 106 and plate 83.

²⁷ A somewhat different type of structure of adobe is described by Morris in the south end of a Pueblo I pit house. See Protokiva I, Site 19, Morris 1939, p. 60 and plate 17.

same size, approximately $2\frac{1}{2}$ meters square, as Rooms C, D, and J, the nearest post-walled rooms.

Except for the posts, the walls were very like those of the stone houses of Site 11. Irregularly shaped stones were laid in crude courses with a liberal use of stone spalls. The 2 largest were 34 by 22 by 14 centimeters and 40 by 22 by 8 centimeters; insofar as there was a predominant size, it was about 25 by 20 by 10 centimeters.

This house was well supplied with pits and fireplaces. In the center of the west room was an irregular pit full of earth and charcoal. In the east room there was a slab-lined firepit against the north wall, the 2 remaining slabs measuring 20 by 22 by 2.5 centimeters and 31 by 19 by 3.5 centimeters, the middle figure in each case being the vertical height of the slab. Near the south wall were 2 pits 25 and 35 centimeters in diameter and 15 centimeters deep without any distinctive fill to indicate function. Under the south wall was an ash pit which apparently was in use before the wall was built and which was probably associated with the earlier jacals.

The significance of posts in the coursed-masonry walls of this house in conjunction with the large use of stones in the post houses at the site may well be great. It seems to show the development of coursed masonry, not from the alternately coursed-stone and adobe "turtlebacks" of Basket Maker III-Pueblo I (p. 191), but from the introduction of increasingly large numbers of stones into jacal construction. It is, of course, possible that this is not a truly developmental phenomenon. Perhaps we see here an attempt to imitate coursed-masonry houses observed elsewhere by the builders, but without complete trust in the ability of adobe mud and stones alone to make a good wall; so that posts were retained at intervals to hold the mass together. Further discussion of this will be found on page 222.

KIVAS. The kivas at Site 12 were as valuable as the houses in illustrating architectural development. At the same time they explained much that was not thoroughly understood about the kiva at Site 11, for at Site 12 as time went on and styles changed a new kiva was dug in preference to remodeling an old one as was done at Site 11.

KIVA 2. Kiva 2 was the older of the 2 kivas at Site 12. Its position in relation to the older houses, the pottery found in it and its architecture all support this conclusion. More conclusive than this is the cross-check with Site 11 where similar architectural features characterized the first phase of the kiva, while the second phase was identical in many features with Kiva 1 at Site 12.

The most important architectural variations in

Kiva 2 were found in the south end. The southern recess, U, instead of being on the same level as the bench, on which the pilasters were set, was but slightly, only 10 to 20 centimeters, higher than the floor of the main room. Consequently, the mouth of the horizontal section of the ventilator shaft was located in the back (southern) wall of the recess.

The divergence was so great that the question arises as to whether this feature should properly be called a southern recess. In terms of earlier subterranean structures on Alkali Ridge, the pit houses at Site 13, it might well be called a southern antechamber. Actually, it had certain characteristics of both

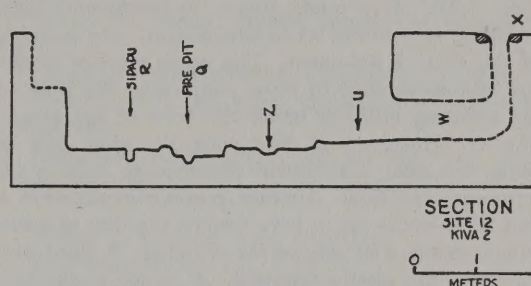


FIG. 26. Cross section through Kiva 2, Site 12, Alkali Ridge.

and differed from both, presenting an excellent example, of a kind never before discovered, of the transition between the southern antechamber of the Basket Maker III-Pueblo I pit house and the southern recess of the later kiva.³²

The close parallel between this kiva and the early phase of the kiva at Site 11 was first realized upon the discovery of 2 cists in the walls of the antechamber-recess, one at each of the southern corners (fig. 89, b). The largest, S, in the southeastern corner, corresponded in position to cist C at Site 11 which was cut into by the reconstruction of the Site 11 kiva when the standard southern recess was installed (see p. 143). It was an oval cist measuring at its largest part 1.76 by 1.20 meters with a maximum height of 88 centimeters, large enough to hold 2 men at once easily. The opening, 35 centimeters above the floor of the southern recess, was 45 by 47 centimeters with a nicely smoothed adobe sill 15 centimeters wide. A sandstone slab of proper size to have served as a cover for the opening was found inside. The interior wall had been plastered and at least partially faced with stones.

In the opposite (southwestern) corner was a smaller oval cist, T, 55 by 32 centimeters at its widest and 51 centimeters high. This also had a definite adobe sill. The opening, 24 centimeters above the floor of the point, see pp. 213-14.

³² For a full discussion of the significance of this

recess, was 23 centimeters wide and 40 centimeters high. The nature of the openings, particularly the plastered sills, demonstrated definitely that these cists were a functional part of the kiva and not (as was the case in Kiva 1, Site 5) old subterranean cists cut into in the excavation for the kiva. It is impossible to say what that function was because of the absence of contents upon discovery. That they served some sort of storage purpose is the most probable explanation.

The only other feature of the antechamber-recess remaining to be described was a line of stones along the floor from north to south (figs. 23; 89, *b*), placed in line with the western edge of the ventilator shaft. This "wall," of a single course 20 centimeters high, consisted of 3 stones set in adobe mud. The meaning of this detail is unknown. The stones were of similar size and appearance to those comprising the walls of the radiating channels under the floor of the kiva at Site 11. However, if they were the same sort of thing, too small a fragment remained to help in determining function. Another possible explanation is that these stones might have formed the face of a low bench on the west side of the chamber. A third possibility is the most interesting. A glance at the map will reveal immediately that the squared-up face of this row of stones lines up perfectly with the west wall of the horizontal ventilator shaft. The ventilator in this kiva was of the early intersecting-tunnel variety (see pp. 207-09). But if any attempt should be made to fill in the antechamber, to make a southern recess, for example, as at Site 11 (above) it would be necessary to build a wall along this very line to serve as the west wall of the northern extension of the horizontal ventilator shaft. Perhaps the 3 stones in question represent the inauguration of such a project which was superseded when the decision was made to build an entirely new kiva, Kiva 1.

A third cist, Y, was found in this kiva, although not in the southern end. The opening was partly in the floor and partly in the wall under the eastern pilaster. Although not so large, it may be considered as corresponding with cists A and B in the kiva at Site 11, presenting another parallel between the 2 structures. The opening, 55 centimeters in diameter, extended 35 centimeters up the wall at its highest point and 16 centimeters out into the floor. The cist increased in diameter beneath the floor to a maximum of 75 centimeters. The depth was 70 centimeters below the floor, and the diameter at the bottom was 58 centimeters.

In the north wall below the bench was a small niche, V, with the bottom of the opening 34 centimeters above the floor. The squarish opening meas-

ured 23 by 23 centimeters, and the hole was 37 centimeters deep. The eastern wall of the niche was a thin, very smooth sandstone slab. No especial contents were found in this niche or in the cist described above.

Kiva 2 had 6 pilasters of the early narrow type,⁸³ resting upon a banquette which was quite irregular and relatively high, running slightly over 1 meter in height. The floor was 190 to 200 centimeters below present ground level. A metate, 5 whole and 1 broken manos, and a grooved axe or hammer made from a mano were found on the floor. In the floor itself, in the north-south line, was a small hole, R, 8 centimeters deep, which may have been a sipapu; a firepit with adobe collar; and an ash pit or ladder hole, Z, 13 centimeters deep, between the firepit and the south wall. The firepit, Q, was relatively shallow with an average depth of but 12 centimeters. Completely encircling it was an adobe collar 3 to 5 centimeters high. Near the center of the pit was a secondary excavation 30 centimeters in diameter at the top and 23 centimeters deep. There was no deflector. The ventilator shaft consisted of 2 intersecting tunnels with a rectangular masonry collar at the ground surface.

KIVA 1. Kiva 1, south of the coursed-masonry house, corresponded to the second phase of the kiva at Site 11. Like that kiva it had 8 pilasters. Unlike it, however, there were no standard Mesa Verde revisions; all of the pilasters being of the narrow type. It also bore a close resemblance to the kiva at Site 7, although it had 2 more pilasters, and the pilasters were not set back from the edge of the banquette. The southern recess was no wider than the others, in fact narrower than some of them. The ventilator again consisted of 2 intersecting tunnels.

Although a large quantity of potsherds occurred in the fill, very little was found in this kiva. There was neither sipapu nor deflector. The only excavation in the floor was the firepit, aa. Like the firepit in Kiva 2, it had an adobe collar. A slab lying on the floor in front of the opening of the horizontal ventilator shaft probably was used to close that aperture. A large irregular sandstone slab, 67 by 49 centimeters and 3.5 to 6 centimeters thick, which might have served as a cover for an entrance hole in the roof was found north of the firepit. Two "dishes" were found on the bench. Such objects were usually made from the bases of corrugated jars, but these two were fashioned by smoothing the edges of a wall sherd from a Mancos Black-on-white bowl and the base of a "water jar."

The walls of Kiva 1 were entirely of undisturbed

⁸³ See pp. 210-11, for discussion of pilaster development.

native earth which had been covered with adobe plaster. In the bench at the west side was a niche, bb, 30 centimeters in diameter and extending 32 centimeters into the wall. It was slightly above floor level. The exact point of contact between the floor and wall was indefinite as the floor curved upward to merge with the wall. The up-curve was not of structural adobe, as is often the case, but of the undisturbed earth of the original excavation.

Immediately southwest of the kiva was a slab-lined stone cist, with some of the slabs projecting above the surface of the ground (fig. 89, *c*). It was approximately 50 centimeters deep and corresponded with "stone boxes" previously described in the Mesa Verde region. The use is unknown.

REFUSE MOUND. The refuse mound, lying south and southeast of the kivas, was excavated completely. It was relatively large, as Pueblo II refuse mounds go on Alkali Ridge, and had been pitted somewhat by pot-hunters but not badly. Stone and bone implements, a great quantity of potsherds, and 3 burials were found. From the potsherds it appeared that the western end of the mound was the oldest. This is further evidence that the post houses and Kiva 2 were older than the stone house and Kiva 1. If the reverse were true, then the earliest occupants of the site must have dumped their refuse to the southwest of their kiva, an unusual procedure, possible of course, but not encountered elsewhere on Alkali Ridge.

Three burials were found, 2 of adults and 1 of a very small infant. Seven pottery vessels were found with these burials, 5 with 1, and 1 each with the others.

BURIALS

BURIAL 1. Female. Age: 36-55.

Photograph: fig. 192, *e*.

Depth: skull found protruding above surface; distal condyle of left femur 7 centimeters below present surface.

Condition: skull intact, although partly exposed; right leg gone, presumably because of exposure; other bones fragile and fragmentary.

Orientation: head to east.

Position: fig. 46, *q*; flexed to left; torso prone; face down; arms pressed tightly to sides and forearms bent up to lie against and underneath the upper arms with hands at shoulders.

Cranial deformation: lambdoidal flattening.

Peabody Museum catalogue no. N/919.

Measurements, indices, and observations: See pages 322-26.

Pathology and anomaly: see page 327.

Associated finds: Pot 1, black-on-white bowl (figs. 69, *b*; 111, *r*; 113, *f*) under skull, face in the bowl; Pot 2, part of black-on-white bowl resting on left shoulder; Pot 3, small jar, upper half indented corrugation, lower half plain corrugation (fig. 152, *e*) resting on left arm; Pot 4, black-on-white bowl (figs. 73, *b*; 114, *b*); Pot 5, fragment of large black-on-white bowl with indented base (fig. 151, *t*).

BURIAL 2. Infant, frontal suture not completely fused.

Condition: skull crushed; skeleton incomplete.

Position: face up; torso position and flexure not observable.

Associated finds: corrugated jar (fig. 153, *b*) to right of skull.

BURIAL 3. Female. Age: about 21.

Photographs: figs. 190, *f*, *f'*; 191, *c*.

Condition: almost complete.

Orientation: head to south.

Position: fig. 46, *r*; flexed to left, torso supine; face up; lower legs bent back against thighs with feet under pelvis; right forearm bent in with hand over pelvis.

Cranial deformation: slight lambdoidal flattening.

Peabody Museum catalogue no. N/920.

Measurements, indices, and observations: See pages 322-26.

Pathology and anomaly: See page 327; fused sacrum and ilium shown in figure 191, *c*.

Associated finds: slab of split juniper wood covering skull and the mouth of Pot 1, fragile and fragmentary when found, at least 16 centimeters long and 8 wide, probably larger originally; no trace of decoration; bone scraper (fig. 186, *d*) to right of pelvis; Pot 1, corrugated jar (fig. 153, *k*) to left of head; Pot 2, fragment of large corrugated jar, including the base, to right of head.

Taxonomic Position of Site 12

PECOS CLASSIFICATION. Pueblo II period.

GILA PUEBLO SYSTEM. Mancos Mesa Phase.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Mancos Focus.

SITE 13 (ABAJO: 7: 13)

MAPS AND PLANS. Figs. 27-45.

PHOTOGRAPHS. Figs. 82, *a, c, d*; 83, *d*; 90; 91, *b*; 92-98.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 99; 100, *a-c, e-p*; 102, *c, n*; 104; 105; 110, *a-c*; 111, *d, e*; 191, *d, g*.

Potsherds: figs. 101, *a-x, bb*; 102, *a, b, d-k, l-o*; 103, *a-cc*; 106-109; 110, *d-r*; 141, *a, b*; 142, *d*; 151, *a, d, h, p*; 165.

Drawings of pottery designs: figs. 52-66; 74, *a, d, e*; 75, *m, q, r*; 76, *c, e*; 77, *k, q, r*; 78, *l, r*; 79, *f, m*; 80, *a, g, i, k-n, q, r*.

Miscellaneous clay objects: fig. 175, *a, b*.

Objects of stone: figs. 47, *e, j, l-o*; 48, *a-d, i, l-n*; 49, *a, b, d, e, g-k, n*; 50, *a-c, e-b*; 51, *b, d, g, k-m, p*; 170, *a, c-k*; 172, *a-g, o-r, t, u*; 173, *a-c*; *e-k*; 174, *a, b, e*.

Objects of bone: figs. 177; 178, *a-j, l, m*; 179; 180; 181; 183, *b, c*; 185; 187, *a*; 188; 189.

ILLUSTRATIONS OF BURIALS AND SKELETAL MATERIAL.

Figs. 96, *a*; 190, *g-b'*; 191, *i-i'*; 192, *g, i, m-n'*.

INTRODUCTION

The earliest stratigraphically dated occupation discovered on Alkali Ridge was at Site 13. Within a quarter of a mile of Site 7, it was found during the excavation of that site toward the middle of the 1932 season. The discovery, by Mr. Lancaster, occurred at just the time when we had become cognizant of the existence of jacal or, as we called them in the field, "post-and-adobe" houses. The jacals were in association with kivas but apparently in many cases were not accompanied by structures with coursed-masonry walls. The potsherds found in connection with these sites were farther advanced in the traditional Southwestern technology than the sherds in Roberts' jacals in the Piedra and also, in their variations, more closely resembled the "Pueblo II" for which we were seeking than anything encountered heretofore.

Surface indications of the post structures are described in detail elsewhere in this report. Sufficient for the purpose here is the statement that, in general, small- and medium-sized stones were stuck into the adobe walls, between the posts, and that these stones, in considerable number but of too small a size to have come from coursed-masonry walls, and accompanied by corrugated pottery and chunks of burned adobe, indicated the presence of the kind of site most interesting to us at that time. Previously located jacal sites were all of the unit type, consisting of a few rooms, a kiva, and a refuse mound. At Site 13 were the remains of long rows of rooms covering an area more

than 100 meters square and showing on the surface only small stones and burned adobe, and at first sight we seemed to have stumbled upon a large jacal pueblo, a startling discovery indeed. Examination, however, presented the new site in an even more remarkable light. The expected corrugated pottery did not seem to be present. In its place was an undecorated gray ware, the sherds occurring in great profusion. And, more greatly to confound the issue, the painted potsherds found, although in the heart of the black-on-white region of the San Juan, were entirely red, or rather, red decoration on an orange base. Further search revealed an occasional upright stone slab extending above the surface of the ruin debris and fragments of stone metates of different shape from those encountered in Pueblo II and Pueblo III sites.

The discovery of Site 13, coming immediately after the excavation of a pit house and early pottery at Site 7, led to the realization that a much greater range in culture existed upon Alkali Ridge than had hitherto been supposed. Obviously, excavation plans had to be revised to accommodate this new development. The 1932 season was then half over, thorough examination of the early Pueblo II sites had only just begun, and the area covered by the new site was so great that both more time and a larger scale of operations were necessary for its examination. The decision reached called for the continuance of the 1932 season's program as formulated, with the addition of 2 weeks' excavation at the new site at the end. On the basis of the latter excavation, plans for

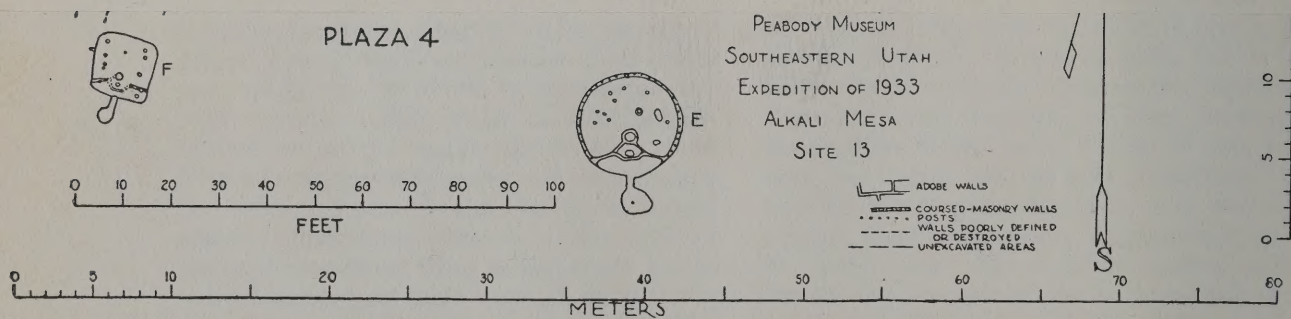


FIG. 27. Ground plan of site 13, Alkali Ridge.

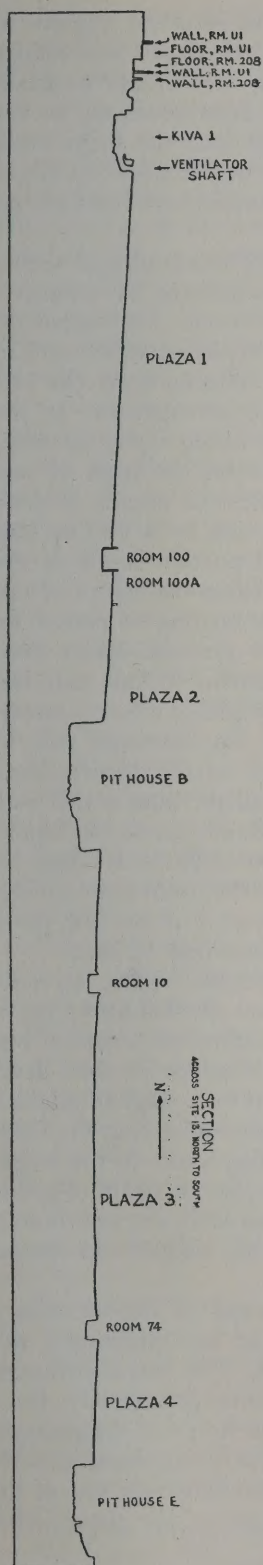


FIG. 28. Cross section through Site 13, Alkali Ridge. Horizontal scale; Pit House B, including antechamber, 12.65 meters. Vertical scale is twice the horizontal scale

further digging at Site 13 during another season could be made, if deemed desirable.

Consequently, at the conclusion of operations at Site 12, 22 storage rooms and a pit house were cleared at Site 13, and a considerable collection of pottery and implements obtained. A study of the results of this test clearly demonstrated that a culture definitely more ancient than Pueblo II was profusely represented on Alkali Ridge, and in 1933 the entire four months' season was spent on the excavation of Site 13.

At the close of the 1933 season, which marked the end of field work for the expedition, the situation at Site 13 was as follows. A pueblo covering an area of approximately 80 by 150 meters had been excavated (fig. 27). It was impossible to place it satisfactorily in the Pecos Classification, because the traits found included most of the diagnostic criteria usually found in open sites, as contrasted with sites in dry caves, for both Basket Maker III and Pueblo I. In addition, stratigraphically beneath rooms of the major occupation, pit houses corresponding closely with the standard Basket Maker III houses as described by Roberts had been found. Furthermore, stratigraphically above rooms of the major occupation a 3-room coursed-masonry unit had been found. In front of that house was a kiva. This unit was of great importance, in itself, because it contained large quantities of both Mancos Black-on-white (Pueblo II) and Mesa Verde Black-on-white (Pueblo III) pottery. Thus we had, for the first time, a definite overlap in a small site of the diagnostic pottery types for Pueblo II and Pueblo III, both in the Gila Pueblo Phase System and in the Pecos Classification as usually defined. To complete the picture, other units had been found as well: Unit 4, a Pueblo II jacal site; Kiva 2, a Pueblo II kiva; and Unit 3, a definitely Pueblo III site, which, from the size of the house mound, probably had been 2 stories in height. Thus at this one location we had the complete known range of Pueblo occupation.

The structures excavated were: 14 pit houses with 2 others located; 118 contiguous storage rooms out of a probable 130; the whole or part of 25 of the above-ground living rooms associated with and attached to the storage chambers; a 3-room coursed-masonry house;

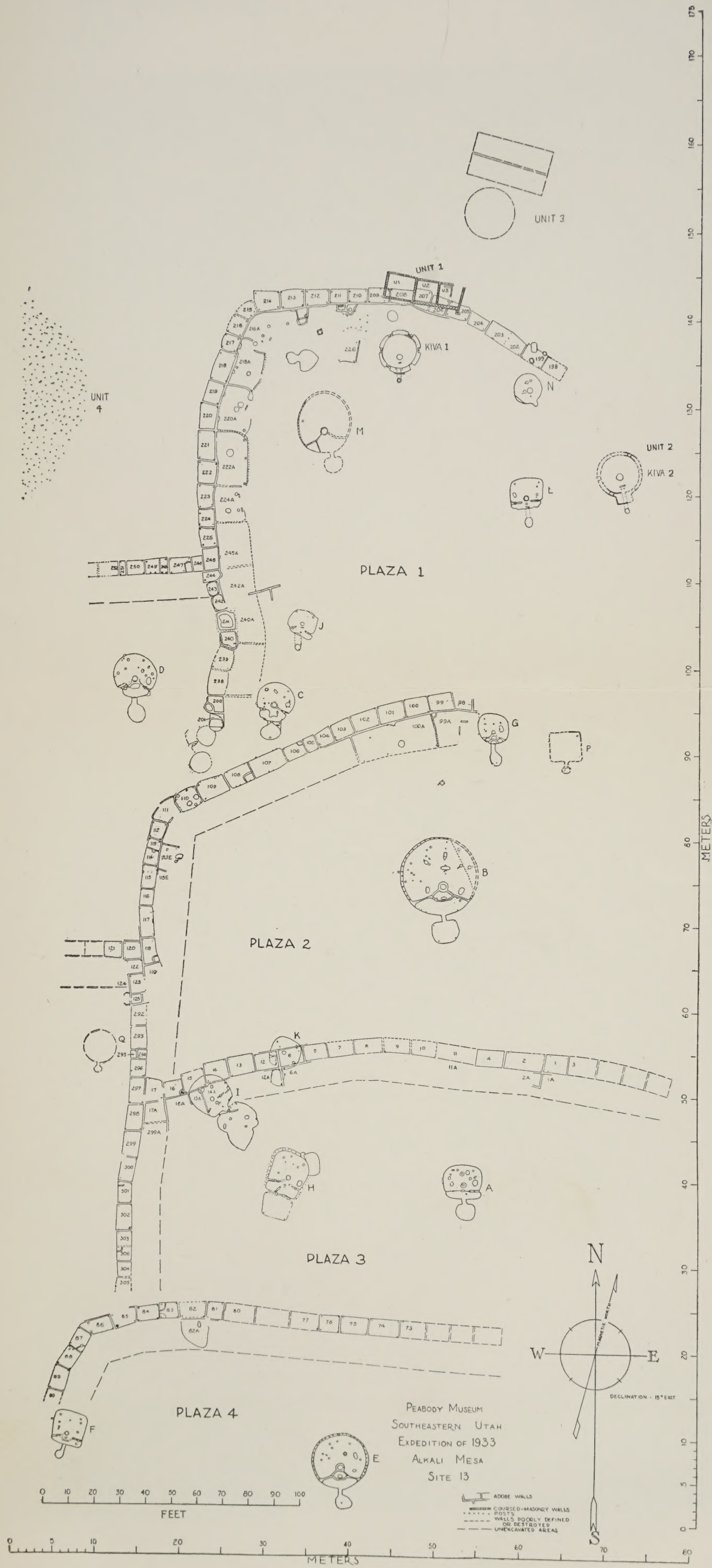


FIG. 27. Ground plan of site 13, Alkali Ridge.

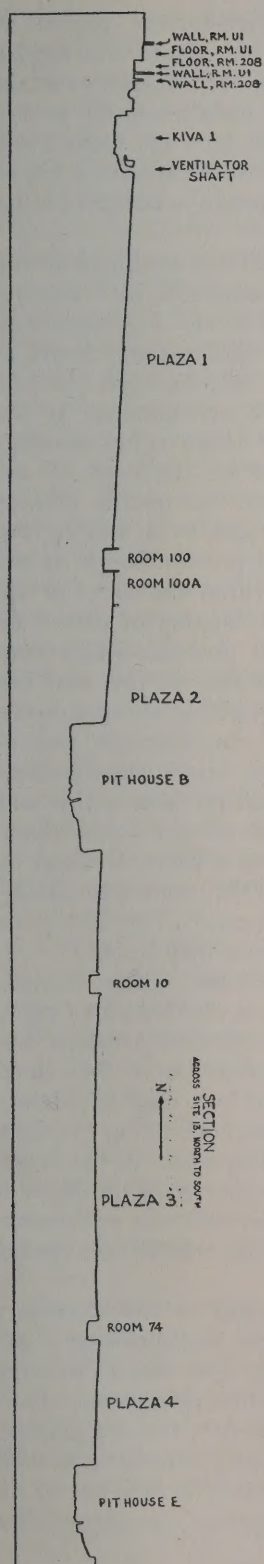


FIG. 28. Cross section through Site 13, Alkali Ridge. Horizontal scale; Pit House B, including antechamber, 12.65 meters. Vertical scale is twice the horizontal scale

further digging at Site 13 during another season could be made, if deemed desirable.

Consequently, at the conclusion of operations at Site 12, 22 storage rooms and a pit house were cleared at Site 13, and a considerable collection of pottery and implements obtained. A study of the results of this test clearly demonstrated that a culture definitely more ancient than Pueblo II was profusely represented on Alkali Ridge, and in 1933 the entire four months' season was spent on the excavation of Site 13.

At the close of the 1933 season, which marked the end of field work for the expedition, the situation at Site 13 was as follows. A pueblo covering an area of approximately 80 by 150 meters had been excavated (fig. 27). It was impossible to place it satisfactorily in the Pecos Classification, because the traits found included most of the diagnostic criteria usually found in open sites, as contrasted with sites in dry caves, for both Basket Maker III and Pueblo I. In addition, stratigraphically beneath rooms of the major occupation, pit houses corresponding closely with the standard Basket Maker III houses as described by Roberts had been found. Furthermore, stratigraphically above rooms of the major occupation a 3-room coursed-masonry unit had been found. In front of that house was a kiva. This unit was of great importance, in itself, because it contained large quantities of both Mancos Black-on-white (Pueblo II) and Mesa Verde Black-on-white (Pueblo III) pottery. Thus we had, for the first time, a definite overlap in a small site of the diagnostic pottery types for Pueblo II and Pueblo III, both in the Gila Pueblo Phase System and in the Pecos Classification as usually defined. To complete the picture, other units had been found as well: Unit 4, a Pueblo II jacal site; Kiva 2, a Pueblo II kiva; and Unit 3, a definitely Pueblo III site, which, from the size of the house mound, probably had been 2 stories in height. Thus at this one location we had the complete known range of Pueblo occupation.

The structures excavated were: 14 pit houses with 2 others located; 118 contiguous storage rooms out of a probable 130; the whole or part of 25 of the above-ground living rooms associated with and attached to the storage chambers; a 3-room coursed-masonry house;

2 kivas; 6 isolated storage pits or rooms; and 2 isolated firepits.

In the following sections of the report the structures of the major occupation will be described under the headings Pit Houses and Rooms. The Units will then be described separately.

PIT HOUSES

Fourteen pit houses were excavated at Site 13 and 2 others located by testing. In this report they will be grouped into 3 structural types which serve to illustrate the early phases of transition from the semisubterranean earth lodge of Basket Maker III to the completely subterranean Classic Mesa Verde Pueblo III kiva. Steps in the change will be traced later in the report and will include early Pueblo kivas as well as the pit houses of Site 13, but for the present the latter only will be considered. Before detailed accounts are given of individual houses the 3 types will be listed and briefly defined.

The types, arranged in chronological sequence in accordance with evidence obtained during the excavations, and the number excavated are as follows:

Type I	3 shallow pit houses
Type II	8 small deep pit houses
Type III	3 large deep pit houses

The chronological sequence of the above list will not be followed in the introductory description. Type II, the most common, will be considered first, then the closely related Type III, and finally Type I, the earliest.

TYPE II: SMALL DEEP PIT HOUSES

PIT HOUSES. A, C, D, F, G, J, L, N.

MAPS AND PLANS. Figs. 27, 29, 31, 32, 34, 35, 39, 41, 42.

PHOTOGRAPHS. Figs. 96, *c, d*; 98, *a, b*.

These were the standard pit houses of the site, found in all sections. In ground plan and depth they were, in general, very like many of the pit houses found in southwestern Colorado, by Morris³⁴ in the La Plata region and by

Martin³⁵ in the Ackmen-Lowry region in Montezuma County. Their depth was similar to that of the later kivas, even though to attain this depth, it had often been necessary to cut down as much as 3 feet into the ledge rock underlying the red earth of the mesa-top. Eight of the 14 excavated pit houses have been placed in this group.

With 3 exceptions each was equipped with a southern antechamber connected by a narrow passageway to the main room. In 2 instances, Pit Houses J and L, a ventilator was found in place of the southern antechamber. In one case, Pit House N, the arrangement at the south end could not be called either an antechamber or a ventilator on the basis of our findings. The main room was usually divided into 2 parts, of unequal size, by a wall cutting across the south-central portion south of the central firepit. This partition was either of upright slabs with a heavy coating of plaster on each side, or of upright post-and-adobe construction. It did not extend to the roof but stopped generally at a height of about 1 meter. The lower portions of the southern pair of roof-support posts were usually incorporated in this wall. In the small pit houses this wall was generally not continuous across the chamber but was divided into 2 parts, 2 wings on the east and west sides of the room respectively. In figures 82, *c*; 95, *a, b*; 96, *b-d*; 97, *a, b*, good examples of such partitions may be seen.

Thus, by the wall described above, the main room of the pit house was divided into 2 parts. The semblance of a continuous partition was obtained either by a difference in floor level between the 2 sections or by a ridge of adobe a few centimeters in height connecting the separated parts of the dividing wall. In the larger pit houses, Type III, and in one of the Type II houses, Pit House F, this wall was continuous with a doorway on either side of the central portion.

South of the firepit and of the secondary ash pit, when the latter was present, a deflector was often found. This was a device to keep the draft from the passageway from acting directly upon the fire; for the passageway apparently served as a ventilator as well. The presence of deflectors is, in fact, one of the best arguments in support of the theory that

³⁴ Morris, 1939.

³⁵ Martin and Rinaldo, 1939.

pit houses were entered through the southern antechambers.

The deflectors were usually set farther to the south than were the wing walls. In Pit House L, which had a ventilator tunnel instead of a passageway, the deflector slab was within 15 centimeters of the mouth of the ventilator (fig. 98, *b*). In the standard pit houses, where passageways are present, this would have been impractically close, as it would have interfered with passage. In most cases the deflector is about halfway between the firepit and the opening of the passageway.

In the 8 Type II pit houses on Alkali Ridge deflectors were not found in 3, Pit Houses A, C, and N. Pit House L had an upright slab, and Pit House J had a slot which presumably had once held such a slab. Pit House G also had a slab, in this case a metate trimmed to a straight edge along the top (fig. 96, *d*). Metates and manos, presumably worn out ones, were often used in building construction at Site 13. Roberts found such use of these to be a common practice in the pit houses at Shabik'eshchee.³⁶

In Pit House D at Site 13 the deflector seemed to have been made of upright posts and adobe, similar to the wing walls. None of the wall structure was found, but a line of 4 post holes was encountered in the normal position for a deflector (fig. 32). Pit House F had a continuous wall like those in the Type III pit houses in which the central section of the wall served as deflector.

In shape the main room varied from an almost true circle to a rectangle with the corners rounded. A similar statement may be made for the southern antechamber. In some cases, however, the latter was asymmetrical in relation to the passageway and the main part of the house. The resulting lopsidedness may be observed clearly (fig. 27) in Pit Houses F and G.

The roof was supported by 4 posts set into the floor at regular intervals, the southernmost on either side incorporated in the partition wall. In one house only, Pit House D, did 6 roof-support post holes appear in a small pit house. Other post holes were common. These were usually much smaller. They probably

served a variety of purposes such as to provide frames for: the suspension of objects for drying, storage, etc.; the support of looms or the winding of the warp threads on looms;³⁷ rope twisting; possible ceremonial altar set-ups; etc.

Post holes were not the only excavations in the floors. Some floors were almost honey-combed with holes of one sort or another. Certain of these were standard features, almost always found, while others seemed to reflect the fancy or industry of the individual builder or user. A main firepit was always found. This is often called the "central firepit," although it very seldom occurs in the actual center of the room. Located usually south of the center in the north-south axis, it was almost always surrounded by an adobe collar 3 to 6 centimeters high, encircling the rim. Usually an extension of the collar on either side connected the firepit with the wings of the partition wall, thereby especially marking off a small area of the floor between the central firepit and the middle section of the partition wall.

In the area so marked off by adobe ridges another standard excavation in the floor was found. South of the central firepit and directly north of the deflector was an oval pit, often containing ash. It occurred in all the deep pit houses, both small and large, and was absent in only one of the shallow ones. One theory as to its function is that in some way it was associated with the cooking and heating systems. Possibly jars of food were set here in hot ashes to keep the contents warm. Roberts had suggested another possible function.³⁸ He thinks it likely that these were "ladder boxes" to serve as a rest for the butt of a single-pole ladder. There seems to be more to it than that, however, for in Structure 1 of his pit houses in the Whitewater district, Roberts shows 2 holes *k* which he believes to be rests for the bottom of a 2-pole runged ladder.³⁹ In the same house is a pit *j* identical with those we are discussing, and in this case he calls it an "ash pit." There seem to be 2 possibilities with regard to Roberts' Structure 1. The 2 holes *k* may represent a set-up for a 2-pole ladder used earlier or later than the single-pole ladder which was set in hole *j*. On the other hand, it seems to me that we should consider the possibility that pits like

³⁶ Roberts, 1929, pp. 45-46.

³⁷ Woodbury, MS.

³⁸ Roberts, 1929, p. 25; and 1939.

³⁹ Roberts, 1939, p. 24, fig. 2.

j which Roberts calls ladder-boxes in his older pit houses may have served an entirely different purpose. Morris, in his La Plata report, does not seem to follow the ladder-box theory. In fact, in one of his pit houses, Protokiva 2, Site 18,⁴⁰ he found a slab covering the hole in this position. Martin, likewise, does not follow this theory. In his Pit House B, Site 2, in the Ackmen-Lowry region he found a situation similar to that in Roberts' Whitewater Structure 1. In other words, the double holes, presumably for a 2-pole ladder, and the larger single hole, which Martin describes as "... lined with sand and filled with ashes, but showed no evidence of fire,"⁴¹ were both found.

This question, it seems, must be left open. The means of entrance to pit houses is not sufficiently established. We can not, as yet, disregard entirely the possibility that in some of them, at least, particularly in the shallow ones (Type I, below) the only entrance may have been through the antechamber. A discussion of theories about the entrances to pit houses will be found in the section of this report describing kiva development (p. 206).

Often, but not always, one other hole was present in the central north-south axis. Very small and relatively deep, usually filled with clean yellow sand, it was found along the northern segment of the axis and corresponded in position and general appearance to the hole called "sipapu" in the later kivas. Consideration of the theory of the sipapu will be found on page 211. Only 2 of the Type II pit houses lacked entirely some hole in that section of the floor where the sipapu is to be expected.

Large oval pits often occurred to the east and west of the central firepit, and various small holes of many shapes and depths were scattered about the floor. Many of these, when found, were filled with fine, hard-packed yellow sand, some had been plastered over with adobe, and others were open when the filling-in of the house began. No implements or utensils were found in any of these holes in the pit houses of Site 13. Their uses probably were many.

Roberts suggests that the large oval pits may have been meal bins. He found a metate in such a pit in House A at Shabik'eshchee, in Chaco Canyon.⁴² He does not, however, present evidence to indicate that the metate was actually set up in the pit as is the case in later, above-floor meal bins.⁴³ Neither metates nor manos were found in any of these pits on Alkali Ridge, nor are such finds reported by Morris and Martin. This reputed function of the large oval pits does not seem very probable to me, if only because of the excessive amount of bending on the part of the miller which would have been necessitated by such an installation. Most of the metates found at Alkali Ridge were in the southern ends of pit houses and in the large above-ground living rooms attached to the long rows of contiguous storage chambers. In neither of these localities were large oval floor pits found.

Before the invention of grinding bins of the type found at Site 12, the metates seem to have been used without special installation or to have been propped up on stones on the floors. In connection with this custom Roberts makes another suggestion of possible use of the large oval floor pits. Describing pit houses at Kiatuthlanna, in eastern Arizona, he says: "The metates were not placed in the depressions but on the floor at one side (of the depressions). It is possible that the corn to be ground was placed in the depression or the finished meal may have been allowed to fall into it from the end of the grinding stone. . . ." ⁴⁴ Recently Flora has published a photograph of a pit house at Durango, Colorado, which shows a metate and mano as found in position alongside one of these large oval pits.⁴⁵

Flora has advanced an interesting theory of the use of the large oval pits. He suggests they may have been "stoves" ⁴⁶ and bases his theory upon the fact that even the central firepits in most of the Durango pit houses are found filled with clean sand. His theory is that pieces of sandstone were heated in open fires, outside the houses to guard against conflagration; carried between 2 sticks into the house; and imbedded in the sand in the pits. To those who

⁴⁰ Morris, 1939, p. 61, fig. 8.

⁴¹ Martin and Rinaldo, 1939, p. 370 and map 22.

⁴² Roberts, 1929, p. 14.

⁴³ Bartlett, 1933, and p. 148, herein.

⁴⁴ Roberts, 1931, p. 18.

⁴⁵ Flora, 1940a.

⁴⁶ Flora, 1940c.

doubt the heat-retaining qualities of sand he suggests the experiment of baking potatoes or roasting unshucked ears of corn in such a contrivance. In a recent letter to me Flora states that he has seen about 25 such pits containing sand and burned sandstone slabs and about the same number containing only sand. Since we are at such a great loss to explain the use of the many holes in the floors of early pit houses, I believe we should consider this suggestion seriously and submit it to checking in future excavations.

Other holes in the floor may be assigned various uses. The shallow bowl-shaped excavations, filled with sand, may very well be concerns in which round-bottomed pottery vessels were set in order to prevent their overturning. They may also have been containers in themselves as many of the deeper holes and bell-shaped cists almost certainly were. They have not all been filled with sand when found. Furthermore, the mere fact that they do have sand in them upon discovery is not conclusive evidence that they were not used as containers. It is generally supposed, and I believe logically, that open holes were filled with sand, when not in use, in order to add to the very limited amount of floor space in a pit house or kiva.⁴⁷

Another point of interest in floor construction was change in floor level. This, when present, occurred at one or both of 2 places. A slight rise in floor level was sometimes found south of the partition wall in the main room, so that the entire southern end was a sort of low dais with a wall at the front of it. The other shift in level was a rise at the entrance of the passageway from the main room to the southern antechamber. It ranged from 20 to 50 centimeters and was found in all Type II pit houses where a true passageway existed (see figs. 29, 32, 34, 35). In Pit Houses J and L, where a ventilator tunnel took the place of the passageway and antechamber, this rise in level did not take place. It was very marked in the Type III pit houses (figs. 30, 33). In the 3 Type I pit houses, which have no passageway but only a doorway between the main room and the antechamber, in only one case, Pit House K (fig. 40), was the floor of the ante-

chamber at a higher elevation than the floor of the main room.

The level thus attained persisted through the passageway and antechamber or rose in a gradual slope until it merged with the southern wall of the antechamber. It did not drop again between the passageway and the antechamber as it does in Roberts' House A at Shabik'eshchee and in his conjectural reconstruction.⁴⁸

Close similarities with the Type II pit houses were found by Martin in the pit houses of the Ackmen-Lowry area⁴⁹ and by Morris in the "protokivas" of the La Plata drainage.⁵⁰

TYPE III: LARGE DEEP PIT HOUSES

PIT HOUSES. B, E, M.

MAPS AND PLANS. Figs. 27, 30, 33.

PHOTOGRAPHS. Figs. 82, c; 95, 96, b.

Three large pit houses were found at Site 13: Pit House B (figs. 30, 95), Pit House E (figs. 33; 82, c; 96, b), and Pit House M (fig. 27). Because evidence obtained during the excavations strongly indicated that they were the latest pit houses in use at the site and because their structural details differed in many respects from those of the pit houses just described, it was decided to label them as of a different type.

One of them was found in each of 3 of the 4 main plazas. Evidently one sufficed for each large section of the site. The form of the main room closely approximated a circle. The diameter of the largest exceeded 9 meters, with an additional 3 meters in the north-south axis to include the southern antechamber. Because of their large size, they might appropriately be grouped in a class labeled "Great Pit House." This has not been done and a numerical designation has been adopted instead in order to avoid the positive implication that they were directly connected with the Great Kivas of the Chaco and Mesa Verde area. The possibility exists, however, that they may have been early examples of that architectural tradition. Also, although quite dissimilar in detail, they may have borne some cultural relationship with the large structure, which Roberts calls a kiva, at the Basket Maker site of Shabik'eshchee.⁵¹

⁴⁷ Morris had found pots *in situ* in these holes, Morris, 1939, p. 60.

⁴⁸ Roberts, 1929, figs. 1 and 2.

⁴⁹ Martin and Rinaldo, 1939.

⁵⁰ Morris, 1939.

⁵¹ Roberts, 1929, pp. 75-81.

and with the 2 "Great Kivas" at Martin's Ackmen-Lowry Site 1.⁵²

The accompanying southern antechambers were correspondingly large in absolute measurements. But in comparison with the houses to which they were attached they were not relatively larger than those of the Type II pit houses and they were relatively much smaller than those of the Type I pit houses.

Another characteristic which differentiated the Type III pit houses was a ring of post holes around the main room, at floor level, north of the partition wall. Set into them at a slight angle from the vertical were posts which presumably rose to meet the roof supported by large posts set farther into the room. At floor level between every 2 posts in the outer ring were pieces of split logs wedged in to serve as braces and keep the posts properly spread. These braces were covered by an apron of adobe as shown in figure 95, *a, b*. Further descriptive details of this structural feature are to be found on page 163. It should be noted that these post holes were *at floor level*, not on a bench on ground level as are similar posts reported from Basket Maker III and Pueblo I pit houses elsewhere, with the exception of Pit Houses A, B, and C at Ackmen-Lowry Site 1.⁵³

The main roof was supported by 6 large posts, 2 more than found in the Type II houses, except for Pit House D which also had 6. The earlier quadrilateral formation of the posts had been abandoned in favor of a circular one. The 6 posts occupied positions suggestive of the placing of the pilasters which were to supersede them in later subterranean structures in the region.

Another distinguishing trait was the nature of the partition across the south end of the main room. Unlimited by the cramping congestion found in the central and southern portions of the Type II pit houses, this partition appeared as a continuous post-and-adobe wall with doorways east and west of the center.

With the exception of their use in 1 small sub-floor cist, hole G in Pit House B, upright slabs were not used in the construction of these pit houses. The partition wall was indented to form a bay south of the firepit. The central portion of the wall served as a deflec-

tor to protect the firepit from the drafts of the passageway to the antechamber. The doorways, with adobe sills, were located on either side of this central section (figs. 30; 33; 82, *c*; 95, *a, b*; 96, *b*).

The formal arrangement of the peculiar sub-floor structures, B, F, G, and N in Pit House B, described on pages 164-65, is very interesting but can not be listed as a diagnostic of Type III, since it was found only in that house and may be unique to it. In other features these houses resemble the Type II pit houses.

In reports of excavations elsewhere I have seen no descriptions of pit houses closely resembling these. The largest pit house at Martin's Ackmen-Lowry Site 2⁵⁴ had poles set in a slant around the edge, but they were imbedded in a bench and had no bracing. Furthermore, the wings of the partition wall were made of upright slabs, the wall below the bench was lined with slabs, and both the main room and the antechamber were rectangular. On the whole this pit house does not possess the diagnostic features of the Alkali Ridge Type III pit houses. Pit House A at Martin's Ackmen-Lowry Site 1, mentioned above as having a ring of posts actually at the floor level, did not resemble the Alkali Type III pit houses in other respects. It was roughly rectangular, with a slab deflector and no partition wall, and with a built-in stone ventilator unit, similar to those found in Pueblo II kivas, instead of passageway and antechamber. It was dated in the latter half of the ninth century, by tree-rings.

TYPE I: SHALLOW PIT HOUSES

PIT HOUSES. H, I, K.

MAPS AND PLANS. Figs. 27, 36-38, 40.

PHOTOGRAPHS. Fig. 97.

Three pit houses, H, I, and K, have been grouped together as Type I. They were quite shallow with floors but 50 to 75 centimeters beneath ground level. In the matter of depth and in some other features they show the closest resemblance of all the Alkali Ridge pit houses to the pit houses at Shabik'eshchee Village.⁵⁵

Perhaps the most significant feature of the shallow pit houses was the size of the southern

⁵² Martin and Rinaldo, 1939, pp. 350-59.

⁵³ Martin and Rinaldo, 1939, map 14 and fig. 73.

⁵⁴ Martin and Rinaldo, 1939, map. 25, pp. 380-83.

⁵⁵ Roberts, 1929.

antechambers. Unlike the tiny ones of the deeper pits, the antechamber was a true room of reasonable size, a respectable apartment which, in the case of Pit House H, was over half as large as the main room itself (figs. 36; 97, *a, b*). This is very important because these pit houses antedate the appearance of above-ground living rooms, and the antechambers presumably served domiciliary functions which, by the time the Type II and Type III pit houses were built, were being performed by the large living rooms 100A, 222A, etc. (fig. 27).

The attribution of an earlier date to the shallow pit houses is not based upon architectural variation alone. Both stratigraphy and ceramic evidence contribute and seem to clinch the matter. Furthermore they bear a striking resemblance to the Basket Maker III Pit Houses B and C on Mesa Verde described in Lancaster and Watson (1943). The first house of this type (Pit House H) was encountered in Plaza III, well away from other structures.

The second and third (Pit House I and Pit House K), however, were found directly beneath the row of rooms between the north-central and south-central plazas, the walls of the rooms being erected upon the refuse and ash-laden earth with which the shallow pits were filled (figs. 38; 40; 97, *c, d*). Each of them underlay the whole or part of 4 rooms, 2 storage rooms and the adjacent living quarters. The complete argument for the dating of the Type I pit houses will be found on page 179.

No passageway existed in these pit houses between the main room and the antechamber. There was merely a doorway through an artificial wall.

Another distinguishing feature found at Pit House H and definitely indicated at Pit House I was a row of post holes, J, at ground level. The posts had been set into the earth at an angle⁵⁶ and formed a slanting wall from the ground to the roof.

The wall below ground level differed from that in the other pit houses, according to our findings, in that it was lined with reeds or reed matting. No indications of such lining were found in the other types.

A final difference from the Type III and from some of the Type II houses was the use

of slabs in the partition walls which was universal in all the Type I pit houses.

The next section of the report will present a detailed description of each pit house, as excavated. Further discussion of the chronological and developmental relationships between the pit houses will be found in the section entitled "The Development of the Pueblo Kiva."

PIT HOUSE A

LOCATION. Site 13, Plaza III, south of Rooms 4 and 11, east of Pit House H.

MAPS AND PLANS. Figs. 27, 29.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 99, *cc*; 100, *k*.

Potsherds: fig. 165, *c*.

Drawings of pottery designs: fig. 52, *j*.

Objects of stone: figs. 48, *c*; 170, *f*; 174, *a*.

Objects of bone: figs. 177, *c*; 187, *a*; 189, *d*.

TYPE. Type II.

SHAPE. Approximately rectangular, with slightly bulging walls and rounded corners.

ORIENTATION. North-south.

FILL. Dark-colored refuse material, many potsherds.

WALLS. Adobe plaster over native earth, with some bedrock at the north end.

PARTITION. Discontinuous, apparently east and west wing walls. Only the eastern one remained, standing to a height of 58 centimeters. It was built of adobe with 1 upright slab and incorporated the southeast roof-support post. It is interesting to note that the location of this wall was provided for by the builders in the original excavation. A glance at the ground plan (fig. 29) will show 2 projections of undisturbed native earth at the points of contact between the main wall and the wing walls. A slight rise in floor level occurs at this point.

SOUTH END. Normal size with floor level slightly raised above main section.

PASSAGEWAY. Floor considerably higher than that of south end, continuing to rise gradually except for a slight depression at the extreme southern border of the southern antechamber. The walls were of undisturbed earth.

SOUTHERN ANTECHAMBER. Irregular in shape. The floor at its highest point was only 60 centimeters beneath the present ground level.

FLOOR. Plaster over bedrock in main room; plaster over undisturbed red earth in passageway and southern antechamber.

FIREPIT. A on plan; roughly circular, cut out of the bedrock, with relatively wide adobe collar.

DEFLECTOR. None found. Oval hole B may be a

⁵⁶ See p. 176, for further description.

slot in which a deflector at one time was set. Hole B may also have been an ash pit, which is often found in this position.

for the collar may have been to procure desired depth for the hole without digging into bedrock. The fact that all the other holes were excavated in the crumbly

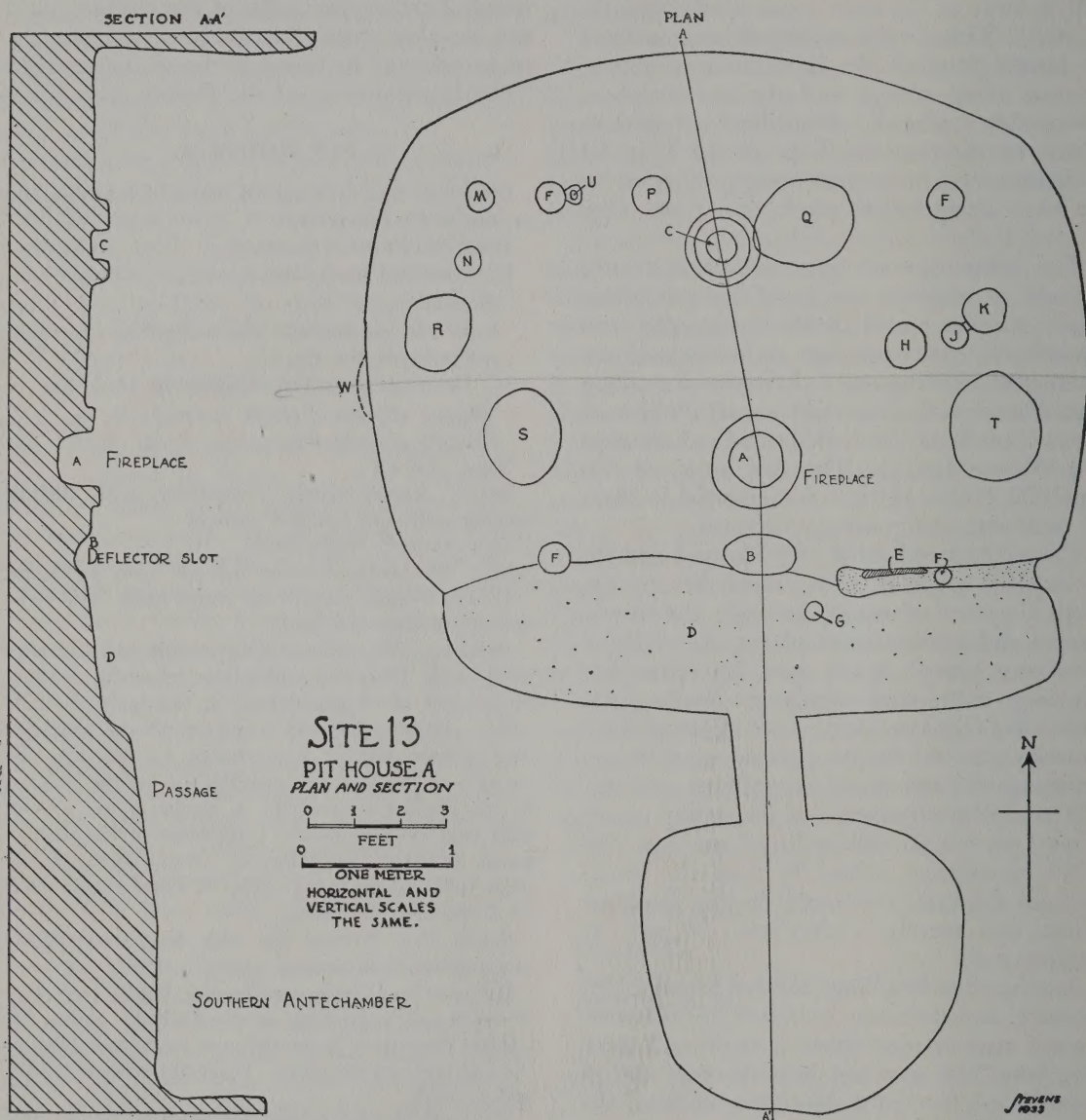


FIG. 29. Ground plan and cross section, Pit House A, Site 13, Alkali Ridge.

SIPAPU. North of the firepit was an unusual hole, C, which may have been a sipapu. It was larger in diameter than most holes called "sipapu" at this period and had an adobe collar. Unlike the collars found around firepits, this one was flat on top. The reason

bedrock not only in Pit House A but also in the other pit houses detracts from the probability of this explanation.

A similar construction, also called a sipapu, was found in the "pre-kiva" at site Ignacio 12:1 at Durango,

Colorado.⁵⁷ The collar was 3 inches high and the hole was provided with a thin sandstone cover. Dimensions were almost identical with those of hole C.

Hole C was situated slightly to the west of the north-south axis. If it was intended as a sipapu and if adherence to absolute position in the axis was as important as we usually assume it to have been, some explanation for the aberration should be found. This is provided by hole Q. The latter, filled with sand when found, lay partly under the adobe collar of hole C. Therefore, the collar and probably the entire unit C was later than hole Q. There was only a slight overlapping of the outer edge of the collar over this hole and perhaps C was placed west of the north-south axis so that for the most part, at least, it would clear hole Q.

POST HOLES. Four main roof-support post holes were found, F on the plan, with charred remains of posts in them. They were in standard position, the southern two incorporated in the partition walls. The charred post remaining in the southeast wing wall stood to a height of 68 centimeters, 10 centimeters above the height of that wall upon excavation. The holes were 20 to 24 centimeters in diameter and 36 to 46 centimeters deep. The diameter of the posts set in them, judging by fragments remaining, were from 12 to 14 centimeters in diameter. The rest of the space in the hole was occupied by pebbles which were packed in to hold the post rigid (see p. 169).

Hole G, situated in the south end, was a post hole, 10 centimeters in diameter and 32 centimeters deep. Charred fragments of the post it once contained remained in place. The use to which this post was put is unknown.

Hole U, although no post was found therein, was probably a post hole also. It was very close to the northwestern main post hole, in fact connected with it by a small groove or shoulder. It was 8 centimeters in diameter and 17 centimeters deep.

OTHER FLOOR HOLES. Eleven other holes were found in the floor, all of them dug out of bedrock. Four of them, Q, R, S, and T, were large oval, basin-shaped holes 55 to 74 centimeters long, 42 to 60 centimeters wide, and 16 to 24 centimeters deep. One of these lay east and one west of the fireplace, apparently a common custom (see p. 156). All four were filled with clean sand when discovered. Hole Q measured 64 by 55 centimeters at the top and was 20 centimeters deep; R was 55 by 42 centimeters at the top; the sloping bottom was 6 centimeters deep at the south end and 16 centimeters at the north end; S was 60 by 48 centimeters and 26 centimeters deep; T was 74 by 60 centimeters and 24 centimeters deep.

⁵⁷ Daniels, 1940, vol. 3, pp. 21-22.

⁵⁸ Roberts, 1939.

Hole B, mentioned above under the heading Deflector as a possible deflector slot, may have been an ash pit comparable to hole D in Pit House B, hole B in Pit House G, and similarly placed ash pits found in most pit houses. Since this one contained no ash at discovery, however, such identification could not be made, and the deflector slot theory must be considered. Another possible use for this hole was as a ladder hole for the butt of a single-pole ladder. In his report of his excavations near Allantown, Arizona, Roberts finds similar holes in corresponding position in his pit houses and calls them ladder holes.⁵⁸ This may be the correct explanation. Holes in this position in other pit houses at Site 13 were all filled with ash, but that does not necessarily rule out the ladder hole theory. Further discussion of this point will be found on pages 155-56.

Six other holes in the floor, H, J, K, M, N, and P, were small basin-shaped holes of the kind often called pot holes. They ranged from 20 to 30 centimeters in diameter and from 6 to 15 centimeters in depth. Holes H, J, K, and M were filled with sand; N and P were filled with ordinary floor refuse. The dimensions were as follows: H, slightly oval, 26 by 28 centimeters at the top, 10 centimeters deep, side wall very regular and smooth; J, 17 by 19 centimeters at the top, 6 centimeters deep, side wall irregular, connected by groove or shoulder with hole K; K, 26 centimeters in diameter, 14 centimeters deep, side wall smooth and regular; M, 18 by 20 centimeters at the top, 8 centimeters deep, side wall irregular; N, 20 centimeters in diameter, 6 centimeters deep, side wall irregular; P, 26 centimeters in diameter and 3 centimeters deep, very shallow but with regular side wall.

Full discussion of floor holes is to be found on pages 155-57.

WALL NICHES. No typical niche. A shallow indentation, W, only 8 centimeters deep, was found at the base of the west wall at its approximate center. The indentation extended up to 30 centimeters above the floor. Its use is unknown.

TAXONOMIC POSITION. Pottery on the floor and in the fill indicated that the pit house was abandoned during the Abajo Phase.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci.

TREE-RING DATE. One specimen⁵⁹ roof timber, dated by Stallings. Outside dated ring, 763 A.D. Estimated cutting date, 770±10. See table 3, p. 90.

⁵⁹ See p. 89, for caution on dating by single specimen.

PIT HOUSE B

LOCATION. Site 13, Plaza II, south of Rooms 98-100.

MAPS AND PLANS. Figs. 27, 30.

PHOTOGRAPHS. Fig. 95.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 99, *m*, *ee*;
104, *b*, *b'*; 105, *f*.Potsherds: figs. 101, *e*, *l*; 107, *b*; 108, *e*.Drawings of pottery designs: figs. 52, *l*, *o*; 58, *f*;
64, *b*.Objects of stone: figs. 49, *a*; 50, *b*; 173, *b*; 174, *b*.Objects of bone: figs. 179, *e*; 185, *e*; 189, *c*.

TYPE. Type III.

SHAPE. Approximately round.

ORIENTATION. North-south.

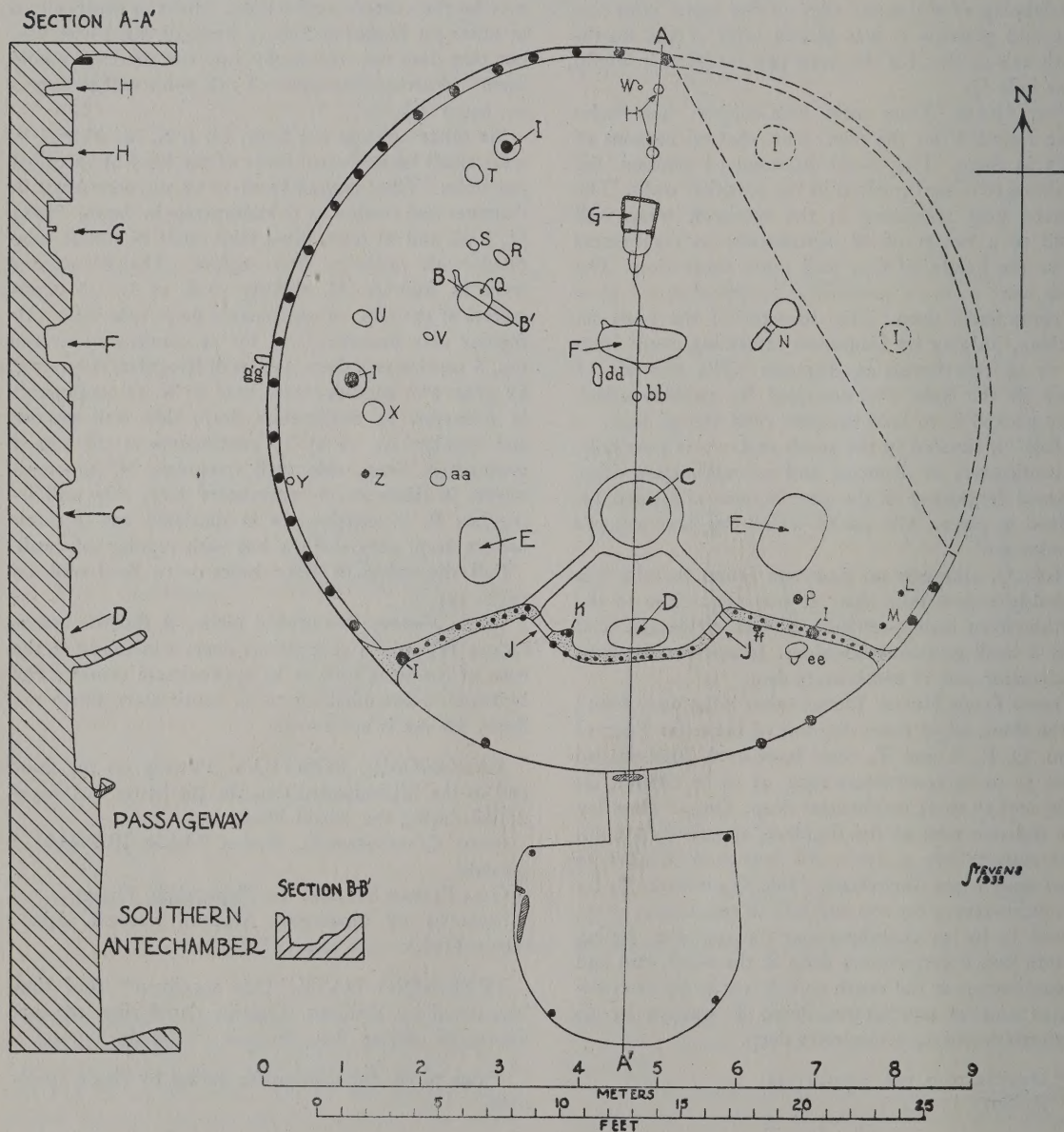
SITE 13
PIT HOUSE B

FIG. 30. Ground plan and cross section, Pit House B, Site 13, Alkali Ridge.

FILL. Hard fill of red earth consisting of blow-sand and wash almost to floor. Directly above the floor were numbers of adobe chunks showing imprints of large timbers, cane, grass, and cedar bark. Charred remains of grass, sage brush, and matted cedar bark, presumably from the roof, were found as well.

WALLS. The large room was cut down more than 35 centimeters in places into the bedrock. This figure varied considerably since the top of the bedrock was by no means level. In the passageway and antechamber, which were not so deep, the walls were adobe plaster over native earth.

When the excavators reached floor level, it was found that the wall of the main room was not simply plaster over undisturbed native materials. Around the circumference of the floor north of the partition wall a series of post holes were discovered, fig. 95, *a, b*. These were apparently for wall posts. Later, similar holes were found in the other 2 large pit houses, E and N, so that they have been considered characteristic of the Type III houses. The posts were 8 to 12 centimeters in diameter and set 36 to 56 centimeters apart at a slight angle away from the vertical toward the roof supported by the main roof-support posts. On the floor, between the posts, short horizontal sections of logs, 6 to 8 centimeters in diameter, were found. These acted as wedges to hold the uprights in position and were covered by an apron of adobe. Fuller discussion of this is to be found on page 158.

It is interesting to note that certain chunks of burned adobe found in the fill near the walls showed impressions of timbers set at an angle to each other. These could be interpreted as fragments of the adobe plaster which covered, on the inside, the junction of horizontal roof timbers with wall posts slanting up to them from the post holes around the circumference of the room. Further conjectures as to the roofing of these structures will be found on page 158.

PARTITION. Continuous; with 2 doorways into the south end. The wall was a true wattle-and-daub, the only such found in a Site 13 pit house. It consisted of upright posts 6 to 8 centimeters in diameter. In addition there were horizontal poles 1.5 to 2 centimeters in diameter laid against the north side of the uprights. The latter poles occurred at 10-centimeter vertical intervals with smaller twigs at right angles between them. The vertical and horizontal poles were held together by means of withes at the intersections.

Two of the main roof-support posts were incorporated in the partition. The western one of the pair was in an unusual position, however, almost at the outer wall (fig. 30).

The 2 wings and the central section of the wall were made separately and then joined together by the addition of the adobe door sills. Because the wall ends were smoothly finished and rounded, it is prob-

able that the high sills found upon excavation were later in construction than the 3 main sections of the wall.

The projection, K, near the ash pit was also a later addition. Made of adobe it encased 2 posts, 1 10 centimeters in diameter, the other 5 centimeters. The function of these posts is unknown. They may perhaps have been installed to prop up a weak spot which had developed in the roof. The fact that the roof-support post incorporated in the western wing of the partition is almost at the outer wall lends some probability to this explanation.

The sills of the doorways were made of adobe mud. The sill of the western door was roughly V-shaped, probably made so by use. The lowest part of the sill was 24 centimeters above the floor of the south end, the highest part was 30 centimeters. The sill of the eastern door was higher, 40 centimeters above the floor. Under this sill was a small hole approximately 10 centimeters in diameter. A similar hole was found under the sill of the doorway between the south end and the passageway to the southern antechamber. For another example, see figure 92, *b*. One was found also in the sill of the entrance to the passageway (see below).

Adobe ridges connected the inner ends of the wings of the partition wall with the central fireplace.

SOUTH END. Commodious; metates, manos, a maul, hammerstones, and pots were found on the floor. The finds support the theory that this part of a pit house was the workshop. All or part of 6 metates were found. The floor level was slightly above that of the main part of the room. An oval pot hole 25 centimeters in its largest diameter and 16 centimeters deep filled with ordinary refuse material was found near the eastern wing of the partition wall. The charred remains of 3 posts were found along the south wall. They were 10 to 12 centimeters in diameter, resting in post holes 28 to 32 centimeters deep. These, set partly into the wall, were probably supplementary roof-support posts.

PASSAGEWAY. Between the south end and the antechamber was a short passageway with vertical walls of undisturbed native earth. The floor, which was approximately level, was 3.2 centimeters above the level of the floor in the south end. At the entrance to the passageway from the south end was an adobe sill 25 centimeters above the passageway floor. Through this sill was a round hole 10 centimeters in diameter which at the time of excavation was closed by a small sandstone slab. This is shown in section A-A', figure 30, and probably served the same purpose as the similar holes in the partition.

On either side of the sill were small upright posts 8 centimeters in diameter. These probably were for the support of a roof over the passageway.

SOUTHERN ANTECHAMBER. A D-shaped room with vertical walls of adobe plaster over undisturbed native

red earth. The charred remains of 4 corner posts were found which evidently supported the roof. They were 8 centimeters in diameter and were set in post holes 28 to 38 centimeters deep.

A large slab was found leaning against the western wall. This may have been a door slab. It is interesting to note that Roberts believed the entrance to the antechamber of Pit House A at Shabik'eshchee to be in similar relative position.⁶⁰

There was a very slight gradual rise from north to south in the floor level which was continuous with that of the passageway.

FLOOR. The floor of the main room was adobe plaster over bedrock. The floor of the passageway and southern antechamber was hard-packed native earth.

FIREPIT. C, circular, with adobe collar. Ash fill.

DEFLECTOR. The central section of the partition wall served as deflector.

SIPAPU. There were 5 holes north of the firepit in or almost in the north-south axis. Two of these, H and H', were of the type usually called sipapu at this period and one or both of them may have served as such. On the other hand, they might have been post holes. They were 10 and 12 centimeters in diameter and 26 and 30 centimeters deep, respectively, both filled with clean sand. The fact that they were filled with sand decreases but does not remove the possibility of their being post holes. The other 3 holes in the axis, F, G, and bb, probably were not sipapus and are described below.

POST HOLES. There were presumably 6 main roof-support posts. Four of these, I, were in the excavated section, where charred fragments remained *in situ*. The position of these 4 suggested that there were probably 2 more in the unexcavated portion of the east side. This would make an arrangement similar to that in Pit Houses E and D. Two of the posts were incorporated in the partition wall; the others were in the floor of the main room. The holes were 30 to 36 centimeters in diameter and 50 to 62 centimeters deep. As was customary in many Alkali Ridge pit houses, the post was much smaller, 12 to 15 centimeters in diameter, and the remainder of the space was filled with hard-packed pebbly gravel to hold the post steady.

In addition there were 3 post holes in the south end; 4 in the antechamber, 1 on each side of the sill at the northern end of the passageway, 2 in the protuberance K which had been added to the partition wall, 33 in the partition wall, not counting the 2 main roof-support posts, and 22 around the circumference of the excavated portion of the main room north of the partition wall. All of these groups have been described in appropriate sections above.

OTHER FLOOR HOLES. Excluding the central firepit, roof-support post holes, and wall-post holes, the number of holes in the excavated portion of the floor of Pit House B was 25. Most of these may be placed in usual categories of ash pit, oval basins, pot holes, and post holes. Four of them, however, F, G, N, and Q presented features which marked them as unusual.

A glance at the ground plan (fig. 30) will show that the very arrangement of these holes, just north of the center of the house, suggests something out of the ordinary. Holes Q, G, and N seem to have been arranged around hole F in symmetrical fashion. One suspects that ceremonial significance may have been attached to this set-up but that cannot be established, one way or the other. Q, G, and N were full of clean sand; F was filled with hard-packed red earth.

Holes Q, G, and N, although different in detail, are all of the same general type and probably fulfilled similar functions. When first found they were thought to be miniature models of pit houses. More mature consideration and comparison with known ancient and modern Pueblo material presented them most probably as small roasting pits. The narrow inclined portion, if such was the case, was the draft hole. The holes are shown in photographs (fig. 95, c, d), cross sections of F and G are shown in section A-A', and a cross section of hole Q is shown in section B-B', figure 30. The little "tail" on hole Q which looks like part of a root furrow was also filled with hard-packed sand and seems to have been part of the structure.

Hole G, in the north-south axis, was the most elaborate (fig. 95, c). It consisted of an excavation in the bedrock in which sandstone slabs were set to make a stone box. In the south side of the box was a relatively large opening giving into a chamber which became narrower while sloping upward toward the floor level. If the theory that these were roasting or cooking pits be correct, the draft could have been regulated by means of this opening. Such an explanation does not fully satisfy. To be most efficient the hole should have been in the bottom, not in the middle and top part of the slab. On the other hand, we certainly can not assume that the occupants of Pit House B knew that.

Hole N was much simpler (fig. 95, d). The main part had no slabs. It was merely a cylindrical excavation in the bedrock, deeper than hole G, 46 centimeters against 32 centimeters. In this case the draft hole, if such it was, did come in at the base of the main chamber. It was a tunnel through the bedrock and part, at least, of the roof was still in place.

Pits of similar design, approximately the same size and larger, have been found in subsequent excavations in the Hopi Reservation in northeastern Arizona.

⁶⁰ Roberts, 1929, pp. 11-15.

And the modern Hopis use a similar design today, on a much larger scale, for their corn-roasting pits.

Hole Q was very like N and identical in depth. The roof of the tunnel here had fallen in. The tail-like groove shown on the map running off to the northwest may have been caused by a root or by some other non-human agency. Hole ee in the south end seems to have been a smaller edition of Q.

The large oval pit F may or may not have been functionally or ceremonially associated with the above. It was, however, of approximately the same depth as Q and N, and like them was flat-bottomed. There were indentations in the north and south walls and another in the northwest corner (fig. 30). Whether or not these were for the purpose of draft is unknown.

Examples of similar though less elaborate construction were found in other Site 13 pit houses. Hole G in Pit House N was similar to hole N in Pit House B. Hole T in Pit House C and hole K in Pit House D had smaller holes connected with them which may have served the same purpose.

The other holes were less striking. In the north-south axis, hole D was a shallow oval pit south of the firepit and just north of the partition wall. It was filled with black ash. A pit full of ash is quite common in this position.

North of the firepit was a small shallow hole bb, filled with floor debris, its use unknown. It seemed too shallow for a post hole.

The other holes in the north-south line have already been described: F and G in this section, above; C under Firepit; H and H' under Sipapu.

To the east and west of the firepit were large basin-shaped holes, E, often found in this position (see p. 155). The eastern one was the larger and deeper. It was 42 centimeters deep, while the western one was only 16 centimeters deep. Both of them were full of sand when found.

Hole aa was a shallow pot hole 12 centimeters deep, full of charcoal and floor debris. Holes R, S, T, U, V, and X are similar holes, mostly deeper, ranging from 10 centimeters to 24 centimeters in depth, and full of sand. Hole dd was an S-shaped hole near the center which may have been merely a break in the bedrock filled with sand.

Hole W was a very small hole only 4 centimeters in diameter and approximately 12 centimeters deep which may have been a small post hole. The fill consisted of charcoal and floor debris.

Holes Y and Z were small, deep holes on the west side. They were 8 and 9 centimeters in diameter, respectively, and 25 and 28 centimeters deep. A charred post remained in Z, and it is probable that Y was a post hole as well. These two may have been a pair: their relationship is similar to that often assumed to indicate upright posts of a loom frame (see p. 155).

Holes M and P on the east side might be interpreted in the same way. They were slightly larger post holes, 30 centimeters deep. Remnants of posts occurred in each. Northeast of M was another post hole L, 6 centimeters in diameter. Two more floor holes were found in the south end. One, ee, seems to have been a smaller edition of hole Q, 25 centimeters deep. The other, ff, was a small post hole 8 centimeters in diameter and 18 centimeters deep, lying adjacent to the partition wall and containing remnants of a post.

WALL NICHES. At approximately the mid-point of the west wall of the main room a hole, gg, was found, carved out of the bedrock. It was 10 centimeters in diameter and extended 26 centimeters into the wall. The center of the opening was 26 centimeters above the floor. Although described here under the heading, Wall Niches, it may very well have been a post hole serving as a seat for a beam extending horizontally into the room.

TAXONOMIC POSITION. On the basis of the pottery on the floor this pit house was used during the Abajo Phase. On the basis of the blow-sand and wash fill it may be assumed that it was abandoned at the conclusion of occupation of the site by people with culture classified as of the Abajo Phase.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci.

PIT HOUSE C

LOCATION. Site 13, Plaza I, east of Rooms 200 and 201, north of Rooms 106 and 107.

MAPS AND PLANS. Figs. 27, 31.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Potsherds: figs. 102, *i*; 103, *bb*; 108, *g*; 110, *g*, *i*.

Drawings of pottery designs: figs. 64, *e*; 65, *e*.

Objects of stone: fig. 172, *b*, *r*.

Objects of bone: figs. 177, *b*; 180, *a*; 185, *d*; 189, *a*.

TYPE. II.

SHAPE. Approximately round.

ORIENTATION. East of north.

FILL. Dark refuse fill, similar to Pit House A.

WALLS. Native earth and bedrock.

PARTITION. Discontinuous, 2 wing walls. The walls were of upright slabs at the base with alternate courses of stone and adobe above, the whole covered with plaster. This was similar to the usual granary wall type (see p. 191). The western end of the eastern wing wall was missing. The eastern wing wall was unusual in other respects. It angled more toward the firepit than the western wing, and definite traces remained of a connection with the adobe collar around the firepit. Such connecting ridges of adobe were not

uncommon (see Pit Houses B, E, and L). A roof-support post was incorporated in each of these walls.

SOUTH END. Slightly larger than usual. South of the partition the floor rose gently. Directly behind the firepit was a large irregular ash pit, F, described below.

only one of the intermediate pit houses without a passageway to the southern antechamber. In this it resembled the shallow pit houses. Although the original excavation did not reach down to floor level on either side, part of the earth between the antechamber and the main room had been removed and

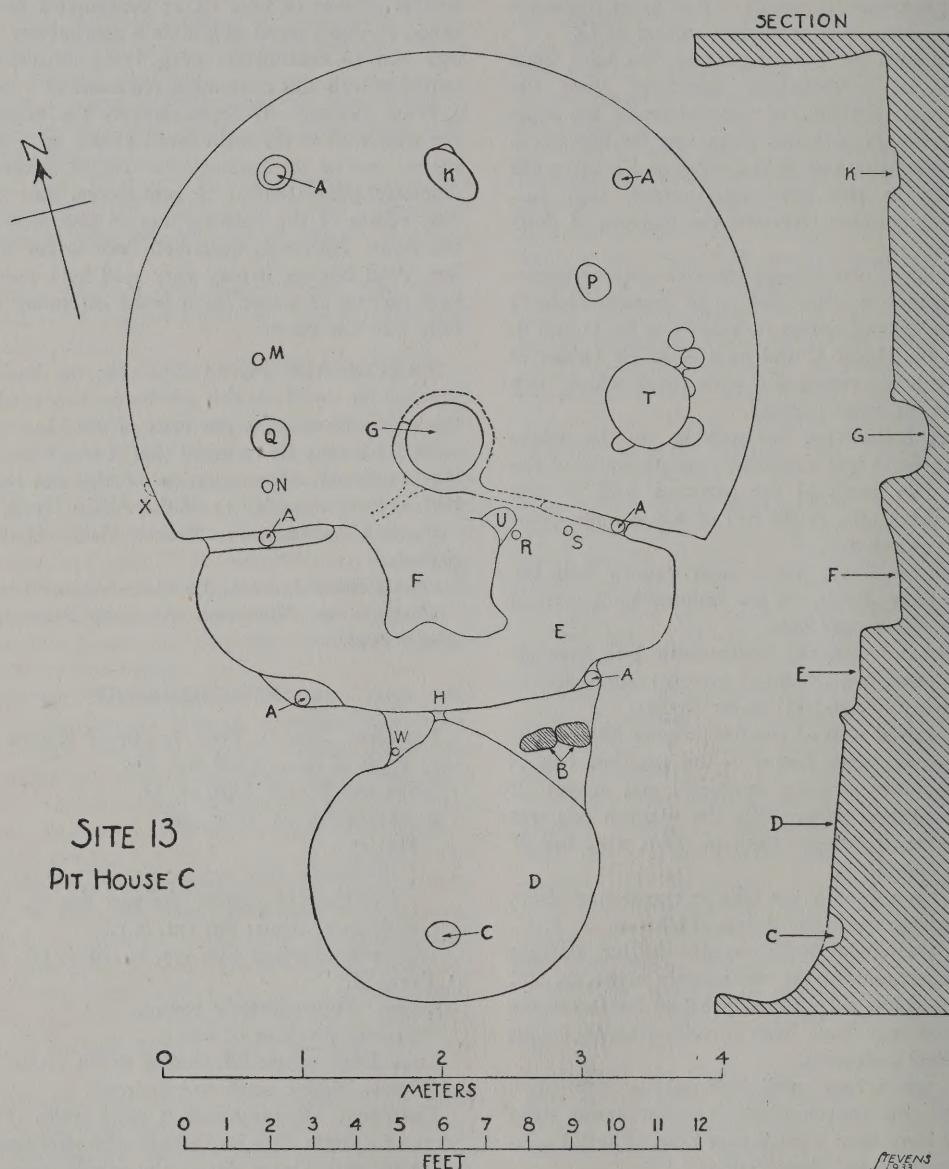


FIG. 31. Ground plan and cross section, Pit House C, Site 13, Alkali Ridge.

PASSAGEWAY. None, merely a plastered sill, H, between the south end of the main room and the southern antechamber. Under the sill was a circular hole 10 centimeters in diameter similar to those found beneath the doorways in Pit House B. This was the

replaced by walls. Little evidence of the nature of these walls remained, merely 2 stones, B, in place east of the doorway and 1 post hole west of the doorway (see plan, fig. 31).

SOUTHERN ANTECHAMBER. Approximately round.

The floor level continued to rise gradually until it blended with the wall. Thus, except for the north side, the room was basin-shaped. A pot hole, C, was found in the floor.

FLOOR. Plaster over bedrock in the main room; some bedrock and some natural red earth covered with plaster in the south end; natural red earth in the southern antechamber, no evidence of plaster. Sand was used in places to equalize irregularities in the bedrock.

FIREPIT. Circular with adobe collar.

DEFLECTOR. No trace.

SIPAPU. Oddly shaped shallow basin, K, in the north-south axis, not the sort of thing usually presumed to be a *sipapu*; probably should not be so classified.

POST HOLES. Six main roof-support posts, A: 4 in the normal position of a 4-post set-up, 2 extra ones in the south end. Remnants of the posts remained. The holes were much larger in diameter than the posts, and the posts were wedged in place by pebbles. The holes ranged from 24 to 26 centimeters in diameter, and the posts were approximately 12 centimeters. The southern pair of posts were not set in pebbles and were only 10 centimeters in diameter.

OTHER FLOOR HOLES. Various pot holes, pits, and post holes of assorted sizes and depths were found in the floor, most of them filled with hard-packed sand. Basins were found to the east and west of the firepit. The western one, Q, was much smaller than customary, although larger than an ordinary pot hole. It was 26 centimeters in diameter and 20 centimeters deep. On the other side of the firepit, Basin T was 50 centimeters in diameter and 22 centimeters deep. Both of these pits were approximately circular, although large pits flanking the central firepit are usually oval. Three depressions were found in the floor at the rim of Basin T (see plan, fig. 31). Whether these were earlier pot holes intersected when the basin was installed or later changes in the rim of the basin could not be determined. To the northeast of Basin T lay 2 shallow pot holes, 10 and 12 centimeters deep, tangent to each other. One of them was connected with T by means of a shallow groove or shoulder. Hole Q and the entire "system" of T were filled with sand.

In the north-south axis the firepit G and hole K have been described above. South of the firepit an ash pit is found in most San Juan pit houses. In Pit House C between the firepit and the antechamber there was a large irregular pit, F, with a south-sloping floor. This seemed to have incorporated a number of smaller holes, of which hole U was the only one maintaining to an appreciable extent its original outline. Hole F was full of dark colored ash when discovered.

Hole P was an oval pot hole 18 centimeters deep,

full of clean sand. Holes M and N, located north and south of Basin Q, 15 and 18 centimeters deep, may have been post holes (see Wall Niches below). Holes R and S in the south end definitely were post holes as the charred ends of the posts remained in place. The latter pair may have held uprights for an earlier wing wall, later replaced by the one found upon excavation. Or they may have been "loom holes."

The final hole to be described is pot hole C in the southern antechamber. It was 16 centimeters deep and upon discovery seemed to be part of a system of most irregular small channels. These were subsequently satisfactorily identified as the work of ground squirrels, who had incorporated the existing pot hole.

WALL NICHES. In the west wall, 36 centimeters north of the wing wall, was a small niche. The bottom of the opening was only 8 centimeters above the floor. The niche was 10 centimeters in diameter and 6 centimeters deep. It is possible that this may have been a rest for the lower horizontal bar of a loom in connection with an upright member in hole N (see p. 155, for discussion of this problem).

TAXONOMIC POSITION. Occupied, abandoned, and filled in the Abajo Phase. This house was typologically contradictory. The round shape, comparable with Pit Houses B, D, E, and M, and a banded-neck sherd in the fill suggest the latter part of the phase. On the other hand, the relative shallowness of the main room, the large size of the southern antechamber, the proximity to the isolated bins near and under Room 201, and the nature of the connection, with no passageway, between the large room and the antechamber, comparable with the Type I Pit Houses H, I, and K, all strongly suggest the earlier part of the phase.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci.

PIT HOUSE D

LOCATION. Site 13, in Plaza V, south of Rooms 250-252.

MAPS AND PLANS. Figs. 27, 32.

PHOTOGRAPH. Fig. 96, a.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Potsherds: fig 103, aa.

Objects of stone: fig. 172, a.

Objects of bone: figs. 179, g; 185, b.

ILLUSTRATIONS OF BURIALS AND SKELETAL MATERIAL. Figs. 96, a; 190, g, g'; 192, n, n'.

TYPE. II.

SHAPE. Round.

ORIENTATION. North-south.

FILL. Odd fill of hard-packed red earth full of small specks of white similar to the white "gyp" which overlies the local bedrock. Many potsherds occurred in the fill. A burial was found in the fill near the floor against the north wall.

A semblance of continuity existed in this wall through an adobe collar around secondary firepit B and a row of 4 post holes south of this which probably marked the site of a post-and-adobe deflector.

SOUTH END. Very slight rise of floor level. There

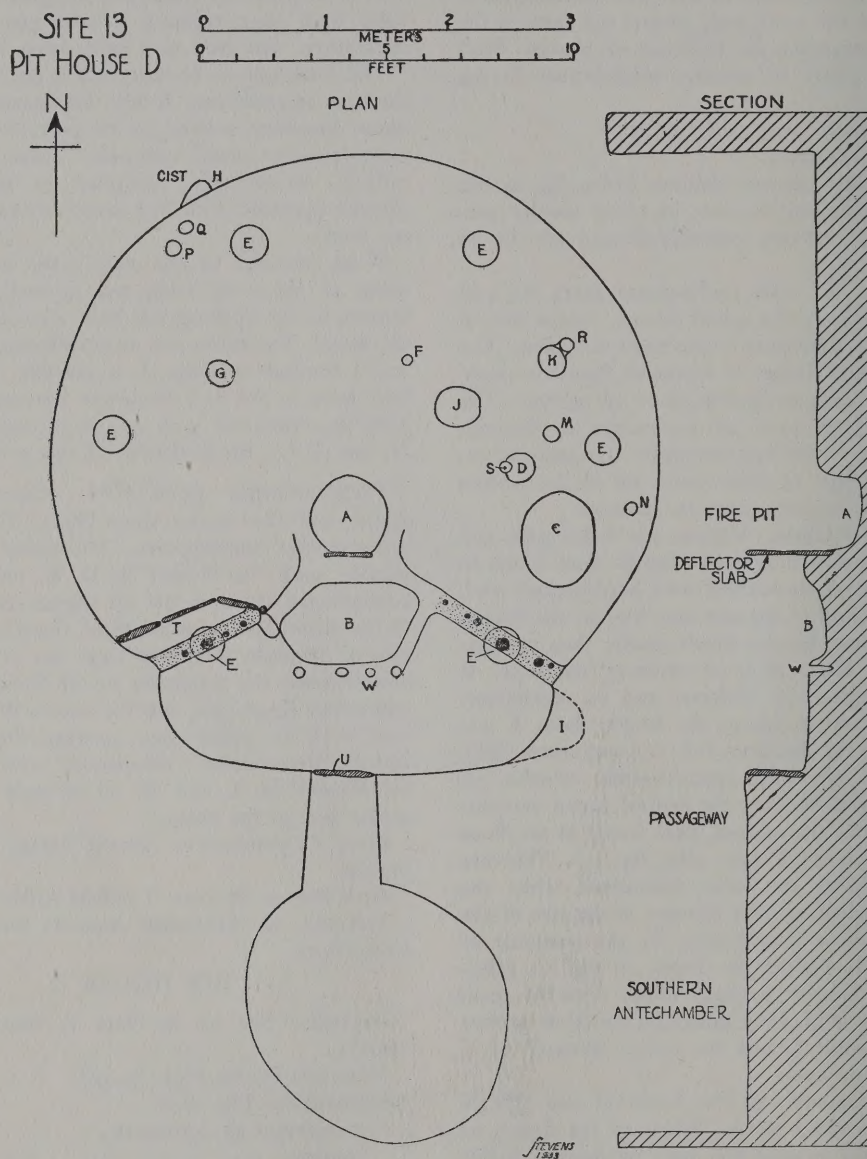


FIG. 32. Ground plan and cross section, Pit House D, Site 13, Alkali Ridge.

WALLS. Adobe plaster over native earth and bedrock; most of the plaster now gone.

PARTITION. Discontinuous, 2 wing walls of post-and-adobe construction, each incorporating a roof-support post. The other posts ranged from 3 to 12 centimeters in diameter, mostly on the small side.

was an irregular recess, I, in the east wall which may have been an architectural feature or which may have been due to a cave-in or misjudgment on the part of the original excavators. If the latter was true, then at the time of use this was probably patched and smoothed over with adobe.

PASSAGEWAY. Wall of undisturbed native earth; floor level 50 centimeters above the floor level of the south end. There was a small sandstone sill, U, at the north end of the passageway.

SOUTHERN ANTECHAMBER. Oval, asymmetrical; floor level as in passageway; wall of native earth, almost vertical.

FLOOR. Adobe plaster over bedrock in the main room, adobe plaster over native red earth in the passageway and antechamber.

FIREPIT. Irregular oval, A; deeper than usual; the floor rose very slightly around the lip, but there was no adobe collar except on the south side, which apparently belonged to firepit B. The hole in the latter position is usually called an ash pit (see p. 155) or "secondary firepit." In this case the sides were sufficiently burned to show that it had been used considerably as a firepit. In addition it was equipped with an adobe collar on 3 sides and seems to have had its own deflector.

DEFLECTOR. Pits A and B both seem to have had deflectors. The upright slab was still in place on the south border of pit A and 4 post holes, W, suggest that pit B might have had a post-and-adobe deflector. The pits were probably used as firepits at different times, Pit A superseding Pit B.

SIPAPU. A small hole, F, slightly east of the north-south axis may have been a sipapu. It was 8 centimeters in diameter and 18 centimeters deep with a sand fill.

POST HOLES. Six in number, E. This seems to foreshadow the 6 pilasters of the San Juan kiva. Sights taken from the center of this room with a Brunton compass showed that these posts occupied the same position around the circle as pilasters did in later kivas. It would be very interesting to know if the posts supported a crib roof. However, this pit house apparently was not destroyed by fire and no timbers remained in the fill to suggest the nature of the roof construction.

The post holes were unusually deep, ranging from 63 to 74 centimeters beneath the floor and dug out of bedrock. Each one was 32 centimeters in diameter at the top. The bottoms were rounded but the walls were almost straight down to within 10 centimeters of the bottom. The northwest post hole had a flat slab 20 by 16 centimeters, upon which the base of the post rested, set in 60 centimeters from the top. The posts, of which decaying remnants were found, were relatively small. They seem to have been from 10 to 15 centimeters only in diameter. The rest of the space was occupied by pebbly stream-bed gravel so tightly packed as to make excavation difficult. Some of the pebbles were 5 centimeters long. They must have provided a very steady setting for the posts.

Because of the large diameters of these post holes, the 2 southern ones were wider than the wing walls in which they were incorporated. Thus the circles of

the post holes on the floor plan project on both sides of the wing walls. The parts of the holes so projecting were filled tightly with pebbles as described above and covered by floor plaster.

OTHER FLOOR HOLES. Holes A, B, and F in the north-south axis have been described above. Hole C was an oval basin to the east of the firepit. A similar basin often occurred to the west of the firepit but was not present in this house. In most cases basins in this position are found filled with sand, but hole C had an ash fill. It was 60 by 76 centimeters in diameter and 32 centimeters deep.

Hole D was a pot hole 30 centimeters in diameter and 14 centimeters deep with a fill of ordinary floor debris. At the west rim of this was a small hole, S, 10 centimeters in diameter and 38 centimeters deep at the west wall where it was free of pot hole D. It tapered at the bottom and was just big enough for a small hand and digging tool. Although nothing was found within to give definite indication of use, it was probably a post hole. In Pit House F hole E closely resembled this two-in-one set-up, and there remnants of a post were found in the smaller hole. A similar case was one of the post holes, G, in Pit House G, but there the post had been let down into a large basin. The chronological relationship of the 2 holes is not definite. At first one would suppose that one must have been used later than the other. This is not necessarily so; they might have been contemporary functional items particularly as many of the floor holes were apparently used only intermittently. Between periods of use holes were usually filled with sand.

A similar two-in-one situation obtains nearby in association with pot hole K which is almost identical in size with pot hole D. There, also, was a post hole, R, 10 centimeters in diameter and 34 centimeters deep, but instead of being let down in part within the wider hole, it was separated slightly from it and connected by means of a groove or shoulder.

Holes M and N, nearby, of approximately the same size as R and S still held charred remains of posts. Holes R and S might have been associated with either or both of these. Or we may be dealing with 2 pairs, M and N on the one hand, R and S on the other, and the fact that post remnants remained in M and N would be evidence that they were in use, either in association or separately, when the pit house burned. Following this line of reasoning, it would be possible to deduce that the use of R and S had been abandoned and the posts removed prior to the destruction of the house. In any case, these holes and P and Q, of similar size near the northeastern roof-support post hole, should be considered in terms of the discussion of "loom holes," rope-twisting machines, etc., on page 155.

Two other pot holes were found, G and J. Both of these were filled with sand. Hole G was slightly oval,

24 by 20 centimeters in diameter and 18 centimeters deep. Hole J was larger, 36 by 32 centimeters in diameter and 25 centimeters deep.

BIN. Along the north side of the western wing wall in the main room was a narrow bin, T, made of upright stone slabs and adobe.

WALL NICHES. No standard-type niche was found. There was, however, a cist, H, in the northwestern wall of the main room. When excavated, the opening at floor level was plugged with 2 stones and adobe. The opening was irregular, 12 to 14 centimeters wide and 26 centimeters high. The hole extended into the wall a maximum of 22 centimeters and 10 centimeters below floor level.

BURIAL. A burial in almost perfect preservation was found in the fill near the floor, against the north wall. There was no trace of a burial pit and the fill directly above the skeleton was of the same character as that elsewhere in the structure at the same level. The skeleton definitely was placed in the house at the time that the lower part of the fill, at least, was laid down, probably not long after abandonment and possibly contemporaneous with abandonment. The potsherds around and above the skeleton were of the Abajo Phase. No vessels or other objects were found with the burial.

Male. Age: about 50.

Photographs: figs. 96, *a*; 190, *g*, *g'*; 192, *n*, *n'*.

Depth: skull 1.3 meters below top of pit house wall; close to floor; deepest part of skeleton, right knee, but 5 centimeters above floor; lowest part of skull 25 centimeters above floor.

Condition: almost complete.

Orientation: head to northeast.

Position: fig. 46, *s*; legs flexed to right; torso almost fully prone, slightly on right side; face to right; left arm flexed at approximately 45 degrees with hand under chest; right forearm flexed across chest with hand under left shoulder; because of pit house wall, the neck was bent back so that the occiput rested on the right scapula, and the face lay with the median part of the maxilla less than 2 centimeters from the bedrock wall; the left humerus also lay 2 to 3 centimeters from the wall; it is probable that these short spaces were originally filled with the plaster on the wall and the flesh on the skeleton, and it seems reasonable to assume that the left arm, chin, and mouth were pressed against the wall.

Cranial deformation: lambdoidal flattening.

Peabody Museum catalogue no. N/932.

Measurements, indices, and observations: see pages 317-21.

Pathology and anomaly: see p. 328.

Associated finds: none.

TAXONOMIC POSITION. Used during the Abajo Phase; probably late because of: (a) typology,

the round form and the 6-post roof-support; (b) the nature of the fill, which is not refuse material as is the fill of most of the intermediate pit houses; and (c) the fact that the depression was far from filled at the time of occupancy of the Pueblo II Unit 4 to the north, as evidenced by a light occurrence of Pueblo II pottery, presumably from that unit, in the top part of the fill. The fill, in the upper 75 centimeters, consisted of blow-sand and wash material containing Pueblo II sherds. The surface, a slight up grade, was littered with Pueblo II sherds in the direction of the refuse mound of Unit 4 and it is probable that this represented the course of the wash by which the Pueblo II sherds were introduced to the top fill.

PECOS CLASSIFICATION. Basket Maker II-Pueblo I periods. Pueblo II period represented in the top fill.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases. Mancos Mesa Phase represented in the top fill.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci. Mancos Focus represented in the top fill.

PIT HOUSE E

LOCATION. Site 13, Plaza IV, south of Rooms 75 and 76.

MAPS AND PLANS. Figs. 27, 33.

PHOTOGRAPHS. Figs. 82, *c*; 96, *b*.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Potsherds: figs. 101, *g*; 102, *d*; 103, *b*, *k*, *l*, *p*; 106, *d*; 107, *a*; 110, *n*.

Drawings of pottery designs: fig. 65, *f*.

Objects of stone: figs. 170, *a*; 172, *o*; 173, *f*, *k*.

Objects of bone: figs. 177, *f*; 178, *c*, *d*, *g*, *j*; 180, *c*; 181, *c*, *f*; 188, *a*.

TYPE. Type III.

SHAPE. Round.

ORIENTATION. North-south.

FILL. Hard red earth; blow-sand and wash.

WALLS. Undisturbed native earth and bedrock. In front of this, in the main room, were posts as in Pit House B. The pit was cut 40 centimeters into bedrock at the north end.

PARTITION. Continuous, of post-and-adobe construction, with 2 doorways. It was similar to the partition wall in Pit House B. The door sills were not so high, however. The sill of the western door was only 6 centimeters above the floor. The eastern door sill was partly destroyed but seems to have been of about the same height. Two roof-support posts, E, were incorporated in this wall. The central section served the double purpose of partition and deflector. Low adobe ridges ran from the ends of the wings to the firepit.

SOUTH END. Similar to that of Pit House B, though smaller. No post holes nor pot holes were found. The floor level was the same as that of the main room.

PASSAGEWAY. Walls of undisturbed native earth. The floor level was 40 centimeters above that of the main room at the north end of the passageway, thence it rose gradually to the antechamber.

tion, fig. 33). No post holes or other floor features were found. This antechamber resembled those of the Type II pit houses rather than that of Pit House B. Floor. Adobe plaster over bedrock.

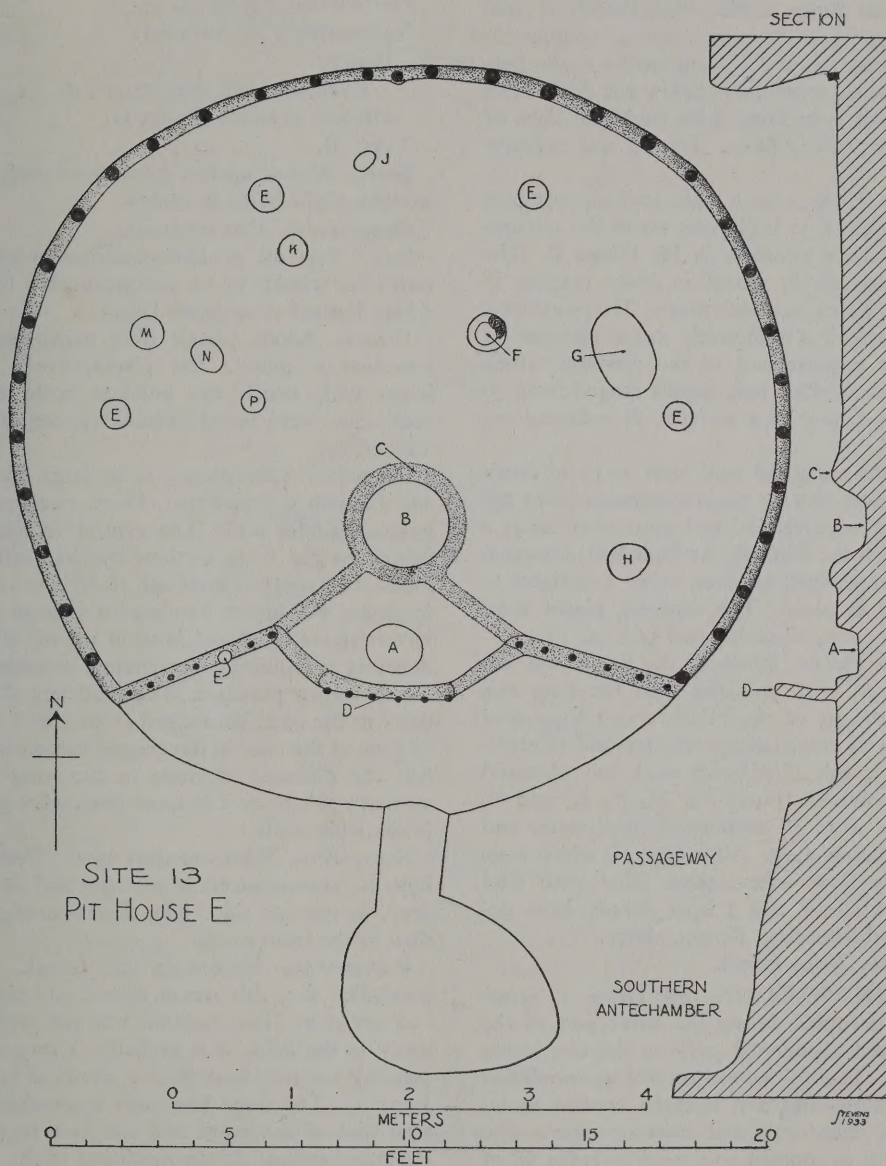


FIG. 33. Ground plan and cross section, Pit House E, Site 13, Alkali Ridge.

SOUTHERN ANTECHAMBER. Asymmetrical and shallow. The floor, at its deepest point, was only 60 centimeters below the ground level at the time of occupancy and 84 centimeters below present ground level. The southern part of the floor curved sharply upward to blend with the south wall (see cross sec-

FIREPIT. Round, with adobe collar.

DEFLECTOR. The central section of the partition wall served as deflector.

SIPAPU. Nothing was found to justify the traditional appellation. The almond-shaped hole, J, in the north-south line was only 6 centimeters deep. The slab-

lined hole, F, slightly east of the north-south axis may have been a sipapu, and, if it had been in a more northerly position, might well be assumed to be such. Slab-lined sipapus were common in Pueblo IV in the Hopi country, but, unless this was one, none were found on Alkali Ridge earlier than Pueblo II (see Site 11, Kiva, p. 143). This hole was 40 centimeters in diameter at the top and 16 centimeters at the bottom, which was 24 centimeters below the floor. The sloping sides had been lined with sandstone slabs of which two were still in place. The fill was ordinary floor refuse.

POST HOLES. There were 6 main roof-support post holes and a series of 32 wall posts set in the circumference of the main room as in Pit House B. The main posts were set in gravel in holes ranging in diameter from 24 to 30 centimeters. The northwest post hole contained a sufficiently large remnant of post to permit measurement of the diameter which was 12 centimeters. Post hole depths ranged from 36 to 56 centimeters; and they were in all instances cut out of bedrock.

The post holes along the wall were 10 to 16 centimeters in diameter, cut 12 to 20 centimeters into the bedrock. Some were vertical and some were set at a slight angle from the vertical. At floor level a section of split log was wedged between every 2 uprights to hold the posts in place. The wedging pieces were covered by an apron of adobe mud (fig. 96, b).

OTHER FLOOR HOLES. South of the firepit was the usual ash pit, A, oval in shape with the long axis east-west. Northeast of the firepit was a large oval basin, G, 84 by 42 centimeters at the top and 28 centimeters deep. It was filled with sand and plastered over when excavated. Holes H, M, N, K, and P, were pot holes 16 to 36 centimeters in diameter and 12 to 20 centimeters deep. All except N, which contained ordinary floor refuse, were filled with sand when found. Holes F and J have already been described under the heading, Sipapu, above.

WALL NICHES. None found.

TAXONOMIC POSITION. Pit House E seems to have been occupied during the latter part of the Abajo Phase and abandoned only at the conclusion of that phase. The fill was a natural accumulation consisting of blow-sand and material washed in by the run-off of rainstorms and melting snow. The nature of the fill in contrast to the refuse-laden fill of most pit houses groups this one with Pit Houses B, D, F, L, M, and N as among the pit houses in use or very recently abandoned at the conclusion of the Abajo Phase.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci.

PIT HOUSE F

LOCATION. Site 13, south of west end of south row of rooms, south of Room 90.

MAPS AND PLANS. Figs. 27, 34.

PHOTOGRAPH. Fig. 96, c.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Potsherds: figs. 101, m; 110, e.

Objects of stone: fig. 50, g.

TYPE. II.

SHAPE. Almost square; corners rounded; north wall straight, slight bulge in others.

ORIENTATION. East of north.

FILL. Top fill of blow-sand and wash extended down to within 30 to 50 centimeters of the floor where burned roof debris began.

WALLS. Adobe plaster over native earth; plaster remained in only a few places; marks of digging sticks with which the builders made the original excavation were clearly visible on the earthen walls (fig. 96, c).

PARTITION. *Continuous*, as in large Pit Houses B and E, with 2 doorways. There were 3 sections of post-and-adobe wall. The central section was connected to the wing sections by door sills of adobe mud. The western door sill, though worn somewhat irregular, was intact, standing an average of 15 centimeters above the floor. Most of the sill of the eastern doorway was missing but enough remained to establish its former presence. The diameters of the upright posts in the partition ranged from 3 to 8 centimeters. In general the ones in the central section were of only half the diameter of those in the wing walls. The southern pair of roof-support posts were incorporated in the wing walls.

SOUTH END. Narrower than usual. There was a pot hole, K, 32 centimeters in diameter and 20 centimeters deep, in the east side. The floor was slightly higher than in the main room.

PASSAGEWAY. Narrowest one found. There is a possibility that this was a tunnel and that the roof had caved in. The question was not settled satisfactorily in the field. It is probably a very narrow passageway but may have been a tunnel as in Pit Houses J and L. The floor level was 20 centimeters higher than that of the south end and rose slightly toward the antechamber. At the north end of the passage was a large adobe sill which projected 10 to 15 centimeters into the south end of the main room.

SOUTHERN ANTECHAMBER. Smallest one found. The floor continued to rise and at the south wall was only 80 centimeters below present ground level.

FLOOR. Plaster over red earth.

FIREPIT. B on the plan; round, no adobe collar; filled with ashes. However, an adobe ridge extended for 20 centimeters from the western part of the parti-

tion wall in the direction of the firepit and markings on the floor showed that it had at one time reached to the rim of the pit. A discussion of adobe ridges in this position appears on page 154 of this report.

to 20 centimeters in diameter and 46 to 52 centimeters deep. Decaying fragments of the posts remained *in situ*. The posts were smaller in diameter than the holes and were wedged with pebbly gravel. As

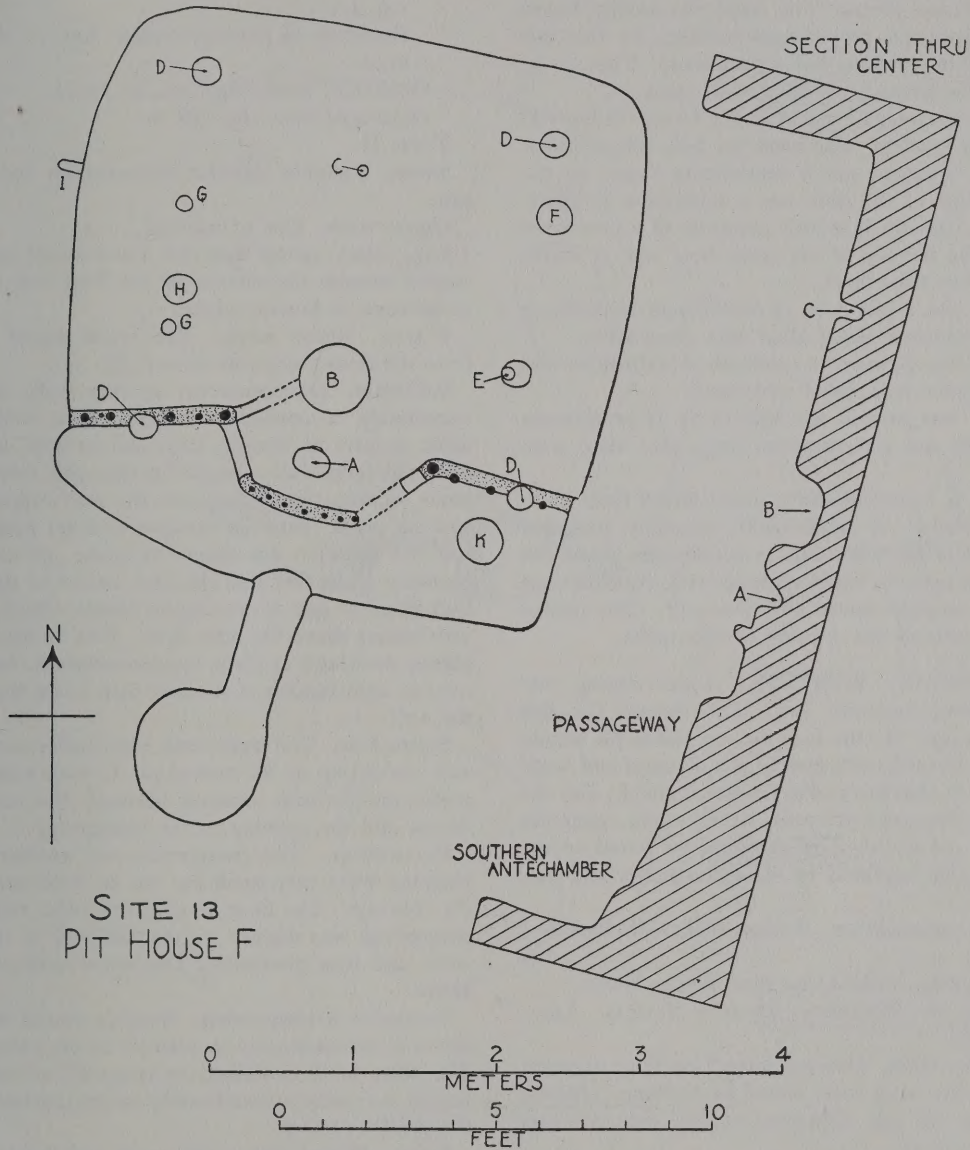


FIG. 34. Ground plan and cross section, Pit House F, Site 13, Alkali Ridge.

DEFLECTOR. Mid-section of partition wall served as deflector.

SIPAPU. A small hole, C, may have been a sipapu. It was 8.5 centimeters in diameter and 16 centimeters deep, filled with ordinary refuse, no special fill.

POST HOLES. There were 4 major post holes, D, 18

usual the 2 south posts were incorporated in the partition wall. For the first time, evidence of the roof structure was found. A charred beam 10 centimeters in diameter was found lying against the east wall and extending from the partition wall to the northeast corner of the room. Whether or not the

beam originally reached over the south end is not known. This may have been the main beam, supported by the east posts, upon which cross-pieces rested. For a discussion of roofs, see page 155 of this report.

OTHER FLOOR HOLES. The large pits usually found flanking the main firepit were missing. In fact this house had fewer floor holes than most. The pit A, south of the firepit, was filled with ashes.

Hole E resembled hole D in Pit House D both in nature and location. The main pot hole was 25 centimeters in diameter and 9 centimeters deep. At the western edge of the hole was a small hole 10 centimeters in diameter in which remnants of a post were found. The bottom of the small hole was 25 centimeters below floor level.

Hole F was a pot hole 30 centimeters in diameter and 10 centimeters deep, filled with clean sand.

The 2 holes, G, were 10 centimeters in diameter and 16 centimeters deep, filled with sand.

Hole H was an oval pot hole 19 by 22 centimeters in diameter and 9 centimeters deep, also filled with sand.

Hole K is described above under South End.

WALL NICHE. A small niche, carefully plastered was found in the west wall 30 centimeters above the floor. The opening was 8 centimeters in diameter and extended 20 centimeters into the wall. The plaster remained around the opening of this niche.

TAXONOMIC POSITION. Used during the Abajo Phase, probably late. The reasons for this conclusion are: (a) the fact that no refuse fill occurs above the burned roof, merely a blow-sand and wash fill similar to the fills in Pit Houses B and E; (b) the nature of the partition wall, which again resembles Houses B and E; (c) a banded-neck jar found on the floor; (d) the smallness of the antechamber and passageway.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci.

TREE-RING DATE. One specimen⁶¹ on floor of south end, probably from roof. Dated by Stallings. Outside dated ring, 768 A.D. Estimated cutting date, 770±10. See table 3, p. 90.

PIT HOUSE G

LOCATION. Site 13, Plaza II, at eastern end of row of above-ground rooms, southeast of Room 98.

MAPS AND PLANS. Figs. 27, 35.

PHOTOGRAPH. Fig. 96, d.

⁶¹ One specimen, however, is not a very good date. The only bright spot in Alkali Ridge tree-ring dating is that the few dates from Site 13 structures are

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 99, ff; 102, c; 104, b.

Potsherds: figs. 102, b, k; 103, t, v; 108, b, f; 109, d, e.

Drawings of pottery designs: figs. 52, d; 54, d; 61, a.

Objects of stone: figs. 172, d; 173, j.

Objects of bone: fig. 188, m.

TYPE. II.

SHAPE. Roughly circular, flattened on the north-east.

ORIENTATION. East of north.

FILL. Dark refuse material; from about 50 centimeters beneath the surface to the floor was a heavy occurrence of burned adobe.

WALLS. Native earth. The walls sloped inward from the floor (see cross section, fig. 35).

PARTITION. Discontinuous; 2 wing walls each incorporating a roof-support post. The walls were made in part of upright slabs and in part of adobe mud. In each wall a single upright slab formed the inner section, that is between the roof-support post and ash pit B. Between the post and the main house wall the partition was simply of adobe. Of great importance is the fact that the east section of the partition stood in part at its original height which was 75 centimeters above the main floor. Part of the original plaster remained in place upon excavation, smoothed over in such fashion as to show that it was the top of the wall.

SOUTH END. The south end was smaller than usual and was cut up by an unusual pit, C, with wide adobe collar or platform situated between the stone deflector and the opening of the passageway.

PASSAGEWAY. The passageway and southern antechamber were very small but not so small as those in Pit House F. The floor level at the north end of the passageway was slightly higher than that of the main room and rose gradually. The walls were of native earth.

SOUTHERN ANTECHAMBER. Roughly round in shape, situated asymmetrically in relation to the passageway. The floor level continued to rise until at the south wall it was only approximately 60 centimeters below the present surface.

FLOOR. Plaster over native earth and bedrock.

FIREPIT. Roughly round, A; adobe collar on south side only.

DEFLECTOR. Stone; a metate set on edge with the grooved side to the north (see fig. 96, d). It was located at the south side of hole B. The stone had been trimmed so that the outlines were more regular

grouped within a short span. This lends some support. See pp. 90-91.

than those of metates in use in their proper function. The top, as it stood in position, was ground smooth and polished. Metates have been found impressed into structural service in other places both at Site 13 (see p. 155) and elsewhere.

partition wall. The holes were much larger than the posts and pebbly gravel was wedged around the posts to keep them in place. In the northeast post hole 2 sandstone blocks helped hold the post in place.

OTHER FLOOR HOLES. Two small post holes, G, were

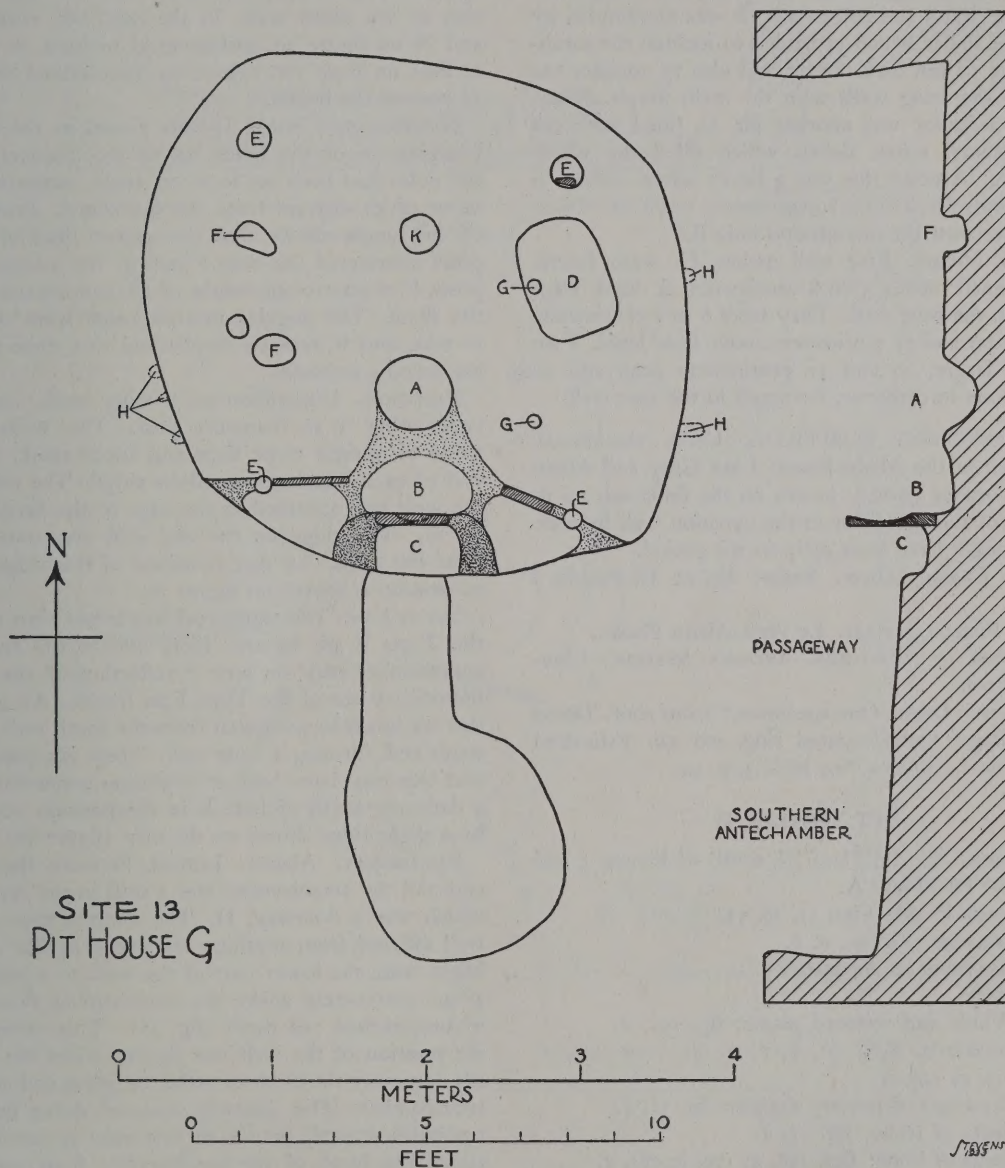


FIG. 35. Ground plan and cross section, Pit House G, Site 13, Alkali Ridge.

SIPAPU. A pot hole, K, north of the main firepit in the north-south line may have been a sipapu. See page 211, for a discussion of the sipapu problem in pit house periods.

POST HOLES. Standard 4 main roof-support posts, the southern two incorporated in the wings of the

found, one of them inside another hole as in Pit Houses D and F. This time, however, the small post was in a large basin, D, one of the largest floor holes found during our work on Alkali Ridge. The latter, approximately 1 meter long and 60 centimeters wide was dug down 30 centimeters into the bedrock and

was full of clean sand upon excavation. Two pot holes, F, full of clean sand were found along the west side. They were 25 centimeters deep, one of them pear-shaped.

South of the main firepit was the usual secondary pit, B, much larger than customary in comparison with the firepit and full of ash. It was surrounded by an adobe collar which expanded to include the southern edge of the main firepit and also to connect the ends of the wing walls with the main firepit. South of the deflector was another pit, C, filled with the same general refuse debris which filled the whole structure. Around this was a heavy adobe collar, 10 to 15 centimeters thick, superimposed upon and therefore later than the one around hole B.

WALL NICHES. Five wall niches, H, were found. Three small niches, 5 to 8 centimeters in depth were found in the west wall. They were 6 to 8 centimeters in diameter and 75 centimeters above floor level. Two slightly larger, 10 and 12 centimeters deep and 10 centimeters in diameter, occurred in the east wall.

TAXONOMIC POSITION. Used, abandoned, and filled in the Abajo Phase, Lino Gray and Abajo Red-on-orange pottery *in situ* on the floor and up to the top of the fill. Slabs in the partition wall indicate that it might have been early in the period.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci.

TREE-RING DATE. One specimen,⁶² from roof. Dated by Stallings. Outside dated ring, 766 A.D. Estimated cutting date, 770±10. See table 3, p. 90.

PIT HOUSE H

LOCATION. Site 13, Plaza III, south of Rooms 5 and 6, west of Pit House A.

MAPS AND PLANS. Figs. 27, 36, 37.

PHOTOGRAPHS. Fig. 97, *a, b*.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: fig. 191, *d*.

Potsherds: figs. 101, *b, c, s*; 102, *a, o*; 103, *d*; 107, *c*; 110, *l*.

Drawings of pottery designs: fig. 52, *q*.

Objects of stone: fig. 51, *d*.

Objects of bone: figs. 178, *a*; 179, *c*; 181, *g*.

TYPE. Type I, shallow pit house.

SHAPE. North side rounded, rest roughly rectangular.

ORIENTATION. East of north.

FILL. Dark refuse material, much burned adobe, potsherds abundant.

WALLS. Adobe plaster on native undisturbed earth.

A situation was found here which did not occur in the intermediate (Type II) pit houses. The wall was only 46 to 52 centimeters high, terminating in a bench into which poles had been set to form the remainder of the wall. The bench ran completely around the main room including the south end, with the exception of the south wall. In the northeast corner, M and N on figure 36, architectural revision to be described on page 178 apparently necessitated removal of part of the bench.

Nineteen post holes, J, were found in the bench. Examination of the holes led to the discovery that the poles had been set in at an angle, estimated at a mean of 57 degrees from the horizontal. Projection of this angle shows that the center lines of these posts intersected the center lines of the 4 large floor posts, F, at an average height of 210 centimeters above the floor. The angular measurements were difficult to take, and it must be emphasized that these figures are merely estimates.

PARTITION. Discontinuous; 2 wing walls, each incorporating a roof-support post. The walls were made of upright stone slabs and adobe mud. At the end of each wing was an adobe ridge. The ridge on the west side extended to the edge of the firepit (fig. 97, *a*). The ridge on the east side may once have done the same. All that remained of this ridge upon excavation is shown on figure 36.

SOUTH END. The south end was larger than that in the Type II pit houses. Here and in the southern antechamber may be seen a reflection of the fuller domiciliary use of the Type I pit houses. An upright slab set in adobe projected from the south wall of the south end, forming a wing wall. There is a possibility that this may have been at one time connected with a deflector south of hole B in the position occupied by a slight ridge shown on the map (figure 36).

PASSAGEWAY. Absent. Instead, between the south end and the antechamber was a wall in the center of which was a doorway, D. The construction of this wall differed from anything else found at Site 13. To begin with, the lower part of the wall, to a height of 38-40 centimeters above the antechamber floor, was of undisturbed red earth (fig. 37). This means that the position of the wall was figured when the builders dug away the earth to make the south end and the antechamber. The doorway was cut down into the undisturbed earth, for the sill was only 35 centimeters above the level of the antechamber floor and was nicely plastered. The plaster on the sill was 4 centimeters thick, beneath this again the red earth.

The top of the undisturbed earth bank was leveled off and on it was placed, on each side of the doorway, a horizontal log 10 to 12 centimeters in diameter. This was plastered about with adobe. Whether or not further logs were laid upon this to form a log wall is

⁶² See p. 89, for caution on dating by single specimen.

unknown. The amount of burned adobe chunks with impressions of timbers found in the fill on either side of this wall would support such a theory. On the other hand, such adobe might have come from the

Type III pit houses. It was an irregular quadrilateral with 4 roof-support posts, G, in the corners. The lower parts of the walls were of undisturbed earth; the nature of the upper parts of the walls is unknown.

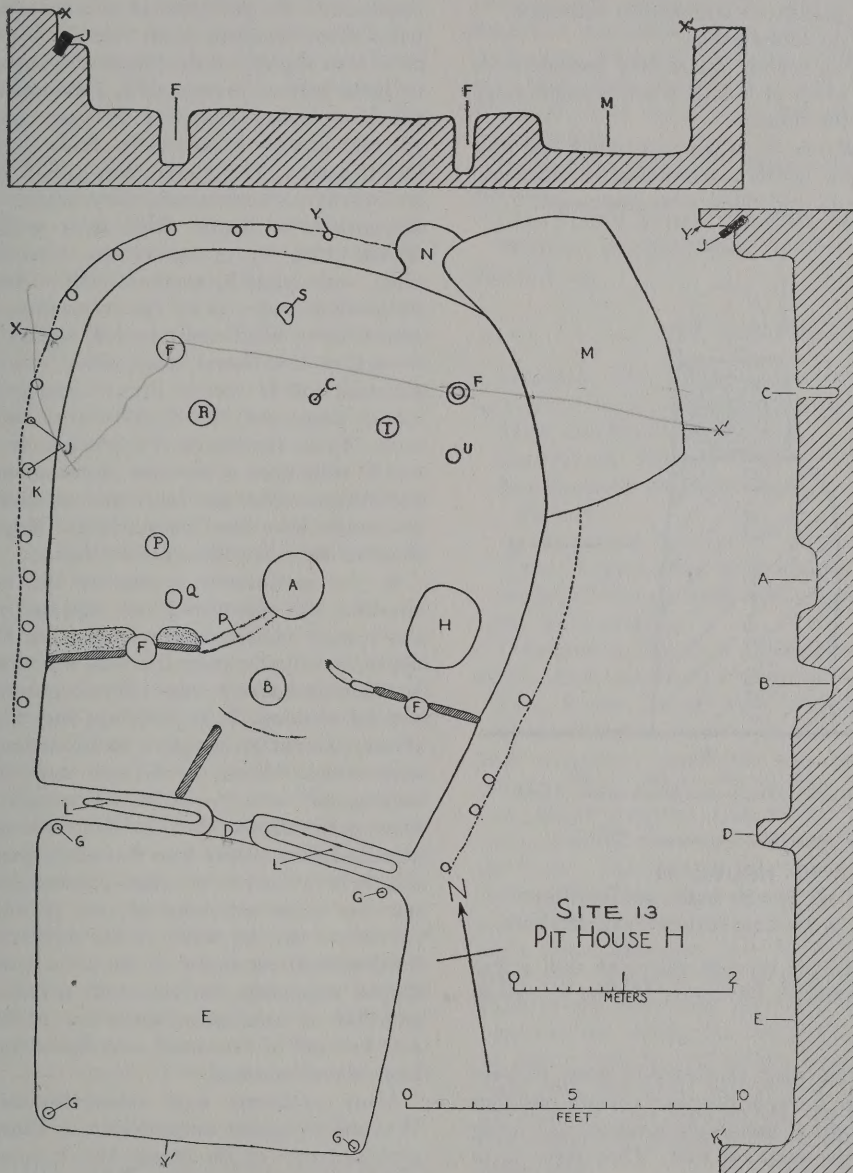


FIG. 36. Ground plan and cross section, Pit House H, Site 13, Alkali Ridge.

roof. Similarly, the height of the wall is unknown. It might have reached solidly to the roof or it might have extended only part of the way as did the partition walls between the main room and the large south end.

SOUTHERN ANTECHAMBER. Relatively very large in comparison with the antechambers of Type II and

No evidence was found of the extension around the antechamber of the bench and post wall system of the main room.

The significant difference between this antechamber and those of the Type II houses is that in this case the room was sufficiently large to have contributed greatly to the living space of the unit. The floor

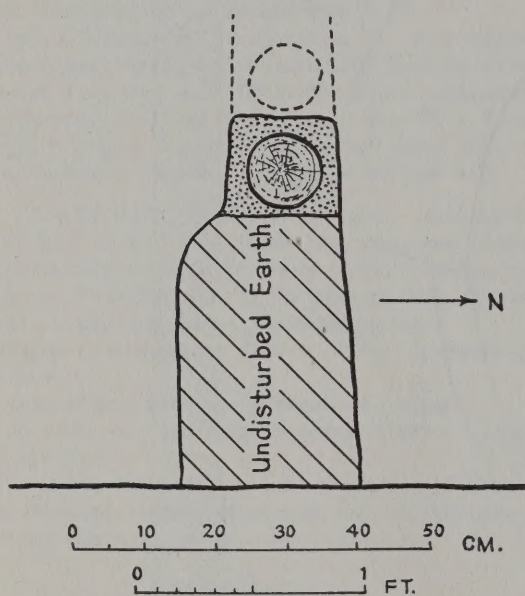
level, too, gives additional evidence that it was more than a mere entrance and ventilator. Instead of sloping or being stepped up nearer the ground surface, the antechamber floor here is deeper even than that of the main part of the large room.

FLOOR. Adobe plaster on undisturbed red earth.

FIREPIT. Oval, no adobe collar.

DEFLECTOR. None found. There may possibly have been a deflector south of hole B where a slight ridge was observed in the floor.

SIPAPU. A small hole, C, in the north-south line may have been a sipapu. It was 10 centimeters in diameter, 34 centimeters deep, and filled with clean sand.



PIT HOUSE H
Cross section of North wall of Southern
Antechamber with conjectural restoration

FIG. 37. Cross section through the north wall of the southern antechamber, Pit House H, Site 13, Alkali Ridge.

POST HOLES. Four main roof-support posts, F, were found in the large room in the same relative positions as those in the Type II house; the southern pair being incorporated in the partition wall. They were 24 to 28 centimeters in diameter and 46 to 50 centimeters deep. No trace of pebbles, so often found in the post holes of Type II and Type III structures, occurred.

The post holes in the southern antechamber were much smaller, 10 centimeters in diameter and 25 to 30 centimeters deep. The post holes in the bench of the main room were 8 to 10 centimeters in diameter and 20 to 30 centimeters deep.

OTHER FLOOR HOLES. South of the firepit was the

usual secondary pit, B, full of ashes. It was much deeper than the firepit as shown in section YY', figure 36. Another customary feature was the large oval pit, H, east of the firepit. This pit was 72 by 60 centimeters wide, 24 centimeters deep, and was filled with clean sand. Six pot holes of various sizes were scattered about the main room (see fig. 36). They were all at least slightly oval. The dimensions and fills will be listed below. In each case, 2 dimensions are given for the opening. These are the long axis and a measurement at right angles to it. Hole P was 22 by 20 centimeters, 11 centimeters deep, filled with sand; Q was 34 by 28 centimeters, very shallow with but 5 centimeters of depth, filled with sand; R, almost round, was 25 by 24 centimeters, 11 centimeters deep, filled with sand; S, another shallow one, was quite irregular in shape, 20 by 15 centimeters, only 4 centimeters deep, filled with sand; T was 23 by 20 centimeters, 7 centimeters deep, filled with soft refuse material; and U was 23 by 22 centimeters, 13 centimeters deep, and, like T, filled with soft refuse material. From the above it is possible to infer that T and U were open at the time of abandonment, though the evidence does not force this conclusion. These 2 pits might have been permitted to fill with ordinary floor refuse at any time before then.

In the northeastern corner of the main room a situation was discovered (see figs. 36, 97, b) which can not be explained completely. For the length of approximately 2 meters the wall was missing and for an additional meter only a few centimeters of it remained standing. In its place was back fill of ordinary refuse material giving place to ash as the bottom was approached. When the fill was removed a roughly rectangular cist or room, M, was revealed. The walls were perpendicular and the floor was approximately 30 centimeters deeper than that of the main room. No definitive evidence of roof construction remained, nor was there any trace of wall plaster which still persevered on the walls of the main room. At the northwestern extremity of the pit was an irregularly shaped appendage, N, also with perpendicular walls and floor 10 centimeters above that of the rest of the pit. In front of N a small remnant of the wall of the large room remained.

Many problems were raised by this discovery. Was the pit earlier or later than or contemporaneous with and part of Pit House H? It appeared at first sight that in the building of Pit House H an earlier pit, of which M had been a part, had been intersected. This was disproved by the fact that, whereas an ash fill was found in M, the immediately adjacent floor of the main room was built upon undisturbed earth. Therefore pit M had never extended farther to the west. Also, no trace of wall or bench was found along the line of contact between pit M and the main room. Furthermore, the edges of the breaks in

the wall and bench presented an appearance definitely suggesting that the wall had at one time been continuous around the main room. Consequently, it was concluded that the pit M was not earlier than the pit house.

If, then, the pit had cut through the wall and bench of Pit House H, was it a later excavation which had been dug down from the surface after the pit house had been abandoned? This, too, was disproved because the west wall of M, of undisturbed earth beneath the floor of the pit house, coincided with the natural curve of that floor. If M had been dug after the pit house was abandoned it is hardly possible that the original line of the floor would have been preserved and would have formed a curving western boundary to an otherwise rectangular pit.

The only conclusion left is that pit M was contemporaneous with and part of Pit House H. Because a section of the wall and bench of the pit house had been removed, it seems certain that pit M was not part of the original structure but, rather, that it represented an architectural revision.

The purpose of the revision is unknown. It has been suggested that it may have served as an entrance, but such a theory would explain neither its shape nor the fact that the floor was at a lower level than the main floor of the house.

A strikingly similar though smaller structure was found at the southwest corner of Pit House B on Mesa Verde and is shown in Lancaster and Watson (1943), figure 22. In the same report a structure of different shape but probably of similar function was found at the northwest corner of Mesa Verde Pit House C. These 2 Mesa Verde pit houses and Alkali Pit House H are all classified in the same culture period, Basket Maker III, and the features in question are probably analogous. In the Mesa Verde pit houses the floors of the secondary chambers were higher than the floors of the main rooms while the floor of our cist M was below that of the main room, but this difference does not seem to be of great importance. Lancaster and Watson call these structures "storage niches" which is a reasonable explanation. The large cists in the Alkali Site 11 kiva and in Kiva 2, Site 12 (pp. 143-44 and 149-50, above) probably represent survivals of this feature.

WALL NICHES. No wall niches were found.

TAXONOMIC POSITION. Most of the pottery in the fill and on the floor was similar to that in the Type II pit houses belonging to the Abajo Phase. However, some of the Lino Gray ware on the floor was very thick and crumbly and on the floor near the north wall was a large sherd of classical Basket Maker III (La Plata) Black-on-white.

Pit House H is considered to be one of the 3

earliest houses at Site 13 for the following reasons: (a) it corresponded in depth, relative largeness of antechamber, and absence of passageway to Pit Houses I and K which are situated stratigraphically underneath one of the rows of Abajo Phase rooms; (b) it corresponded more closely than do the Type II houses to the Classic Basket Maker III pit houses described by Roberts;⁶³ (c) the pottery on the floor presented more sherds of earlier type than were found in all of the Type II and Type III pit houses put together.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci.

PIT HOUSE I

LOCATION. Site 13, Plaza III, underlying living rooms 14A and 15A and storage rooms 14 and 15.

MAPS AND PLANS. Figs. 27, 38.

PHOTOGRAPH. Fig. 97, c.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Potsherds: figs. 101, i; 103, a, x; 107, d.

TYPE. Type I, shallow pit house.

SHAPE. D-shaped, south wall approximately straight, other walls curved.

ORIENTATION. North of west; greater deviation from north-south than any other pit house at the site.

FILL. Refuse, heavily laden with potsherds.

WALLS. Unknown. Because of the superimposed later structures, insufficient wall height remained to permit a determination. The floor of the main room was smooth and well made so that the outline of the room could be traced by means of the termination of the floor. The base of the wall between the south end and the antechamber was of upright slabs covered with adobe plaster, and it is possible that upright stone slabs may have formed part of the outside wall. There is also a suggestion that part, at least, of the walls may have been of post-and-adobe construction. Along the east wall ran a low bench of adobe mud 20 centimeters high in which an upright post, J, was set. Although it could not be traced farther, it is quite possible that this bench might have run completely around the main room except for the south wall.

PARTITION. Discontinuous; 2 wing walls of upright slabs, incorporating 2 roof-support posts, I. It is probable that the western wing had an easterly extension beyond the post hole but no trace was found. The slabs had been covered with adobe mud.

SOUTH END. Commodious. Two post holes, U and V, close together, were found along the southeast

⁶³ Roberts, 1929.

wall, and there was a small pot hole, D, between the deflector and the doorway into the southern antechamber.

PASSAGEWAY. None. There was no passageway, because, as in Pit House H, only a thin wall with a

shallowness of the fill and the intensity of the later occupation the walls of the antechamber were difficult to follow. The members of the expedition are not completely satisfied that the irregular line on the map (fig. 38) represents the exact outline. Parts of the

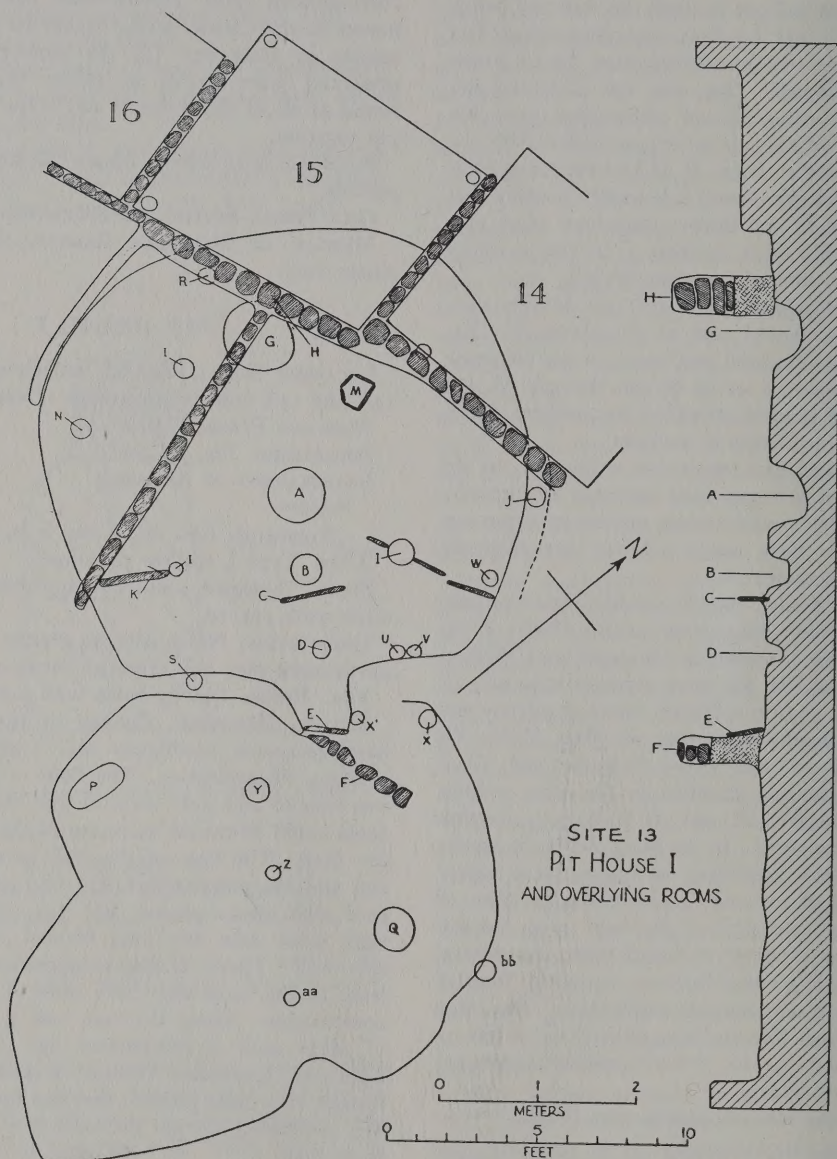


FIG. 38. Ground plan and cross section, Pit House I, and Rooms 14, 15, and 16, Site 13, Alkali Ridge.

doorway separated the south end from the antechamber. The wall was of upright slabs at the base, covered with adobe plaster. Most of it had been destroyed but it was possible to trace its outline and nature.

SOUTHERN ANTECHAMBER. Large. Because of the

wall stood out clearly but some of it was indefinite. It is certain, however, that the antechamber resembled more closely in relative size the large one of Pit House H than it did the small ones of the later pit houses.

The floor was much less even than that of the main

room and at a slightly higher level. Six post holes, X, X', Y, Z, aa, bb, and 2 pot holes, P and Q, were found in it. If the post holes were for the support of a roof, they form a pattern at once more restricted but more probable and regular than the amorphous outline shown on the ground plan. The outline as drawn is quite uncertain.

FLOOR. Adobe plaster over red earth.

FIREPIT. Roughly circular; deep, with a slanting bottom (see cross section, fig. 38); ash fill.

DEFLECTOR. Upright slab, set in adobe, between the ash pit B and the antechamber doorway.

SIPAPU. In the place where the sipapu should be was a large basin, G.

POST HOLES. Four main roof-support post holes, I, were found. As the map (fig. 38) shows, 2 of them were set farther away from the outer wall than usual. They were 24 to 26 centimeters in diameter and 50 to 58 centimeters deep. Twelve other post holes were found around the walls and in the antechamber, J, R, S, T, U, V, W, X, Y, Z, aa, and bb. Their functions are for the most part unknown, but it is probable that S, U, and V helped support the main roof. A possible use for J is suggested under Walls above, and T, X, Y, Z, aa, and bb probably had to do with the antechamber walls and roof.

OTHER FLOOR HOLES. Between the firepit and the deflector was a pit, B, full of ashes. Under the later walls, in the main axis was a large oval pit, G, 98 centimeters in its longest diameter and 36 centimeters deep. It contained soft earth and a small quantity of sand. Near it was a pentagonal cist, M, 18 centimeters deep, lined with upright slabs, and filled with soft earth. Near the western edge of the main room was a shallow oval pot hole, N, 22 by 30 centimeters in diameter and 11 centimeters deep. This also was filled with soft earth and a little sand in the bottom.

In the antechamber were 2 shallow pot holes, P and Q, 10 to 12 centimeters deep.

WALL NICHES. None found.

TAXONOMIC POSITION. With Pit Houses H and K this was one of the 3 earliest pit houses on the site. It lay underneath storage rooms 14 and 15 and the adjoining living rooms 14A and 15A. The stone walls of these rooms were built upon fill in the pit house. This fill contained large quantities of Abajo Red-on-orange and Lino Gray potsherds. One Classic Basket Maker Black-on-white potsherd was found on the floor. A single sherd is of very little value, but this one assumes some importance when taken in conjunction with the architectural stratigraphy, with the architectural similarity of Pit House I to Pit House H where a relatively large amount of Basket Maker III Black-on-white pottery was found, and with the total absence of such sherds in most of the Site 13 pit houses.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci.

PIT HOUSE J

LOCATION. Site 13, Plaza I, east of Rooms 240 and 241, northeast of Pit House C.

MAPS AND PLANS. Figs. 27, 39.

PHOTOGRAPH. Fig. 98, a.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Drawings of pottery designs: fig. 65, d.

TYPE. Type II, variant.

SHAPE. Irregular. This was the most irregularly shaped pit house found. It might be described as very roughly circular on its western side and very roughly rectangular on its eastern side.

ORIENTATION. Mixed. Here again was a striking irregularity. The line of the ventilator and/or entrance is due north-south, whereas the line of the centers of the ventilator opening, deflector slot, and central firepit is considerably east of north (see fig. 39).

FILL. Dark refuse fill.

WALLS. Walls of undisturbed red earth and bed-rock. The latter is in some places as much as 40 centimeters high above the floor level. The walls were not vertical everywhere, but in some places sloped inward from the bottom.

PARTITION. No partition wall was found, but traces of it were observed. A ridge was found in the southwestern corner where a marked difference in floor level occurred between the south end and the main room. This ridge, shown by a solid line in figure 39, probably marks the line of the partition wall, which seems to have incorporated the southwestern roof-support post. There was also a slight projection of the main wall where such a partition would have joined it.

On the east side, no definite ridge was noted, but a much larger projection of undisturbed "white gyp" was found (see fig. 98, a). Also, as well as the roof-support post hole, there were 2 other holes in the floor, holes, F, which might have been for the small posts of a post-and-adobe partition wall.

The conclusion is that, although no wall was found upon excavation, evidence points to the probable one-time presence of a discontinuous partition wall consisting of 2 wings incorporating the roof-support posts.

SOUTH END. Small on west side. On that side the floor level was slightly higher than that of the main room; in other places it was of the same level as the floor of the main room or slightly lower. An irregular hole, C, filled with mixed refuse, was found in the center.

PASSAGEWAY OR VENTILATOR. In place of the straight-walled passageway usually running in a southerly direction from the south end was found a tunnel, G. This intersected a vertical shaft, E, the base of which was slightly wider than the horizontal

was at approximately the same level as the floor on the northern side of the main room.

The question now arises as to whether this tunnel system is merely a ventilator or an entrance as well. In Pit House L an intersecting-tunnel ventilator was

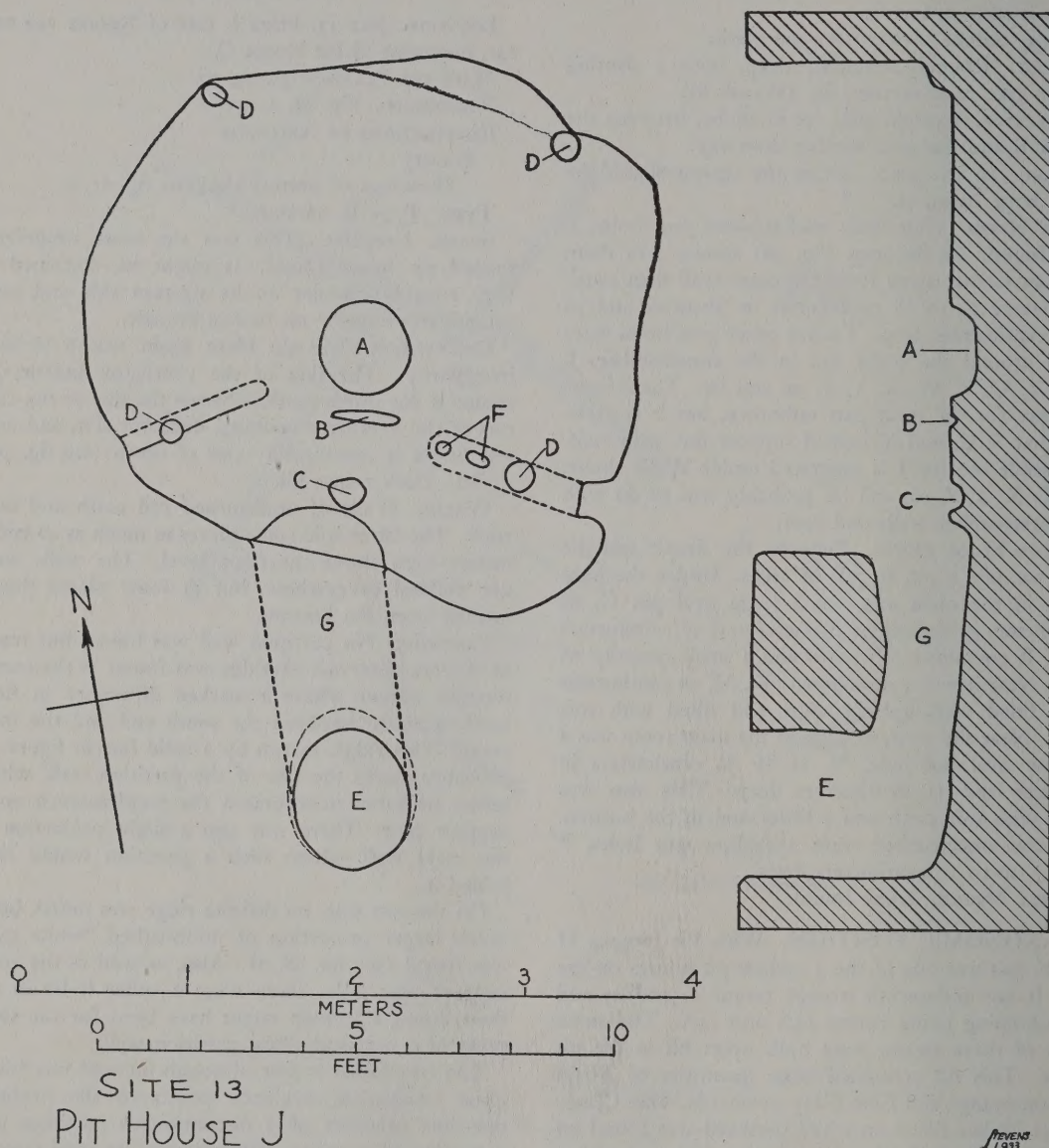


FIG. 39. Ground plan and cross section, Pit House J, Site 13, Alkali Ridge.

tunnel. The tunnel and shaft were dug out of undisturbed red earth. At the opening into the house, the floor of the tunnel was from 10 to 12 centimeters lower in level than the floor of the south end (fig. 98, a). From that point on the floor rose gradually until at the southern border of the vertical shaft it

discovered which could not possibly serve as an entrance, and in the subterranean structures of subsequent cultural periods only ventilators occur in this position. In Pit House J, however, because of the size of the tunnel and shaft and because of the deepening of the floor level, it seems quite possible that this

was still an entrance. A full discussion of this point appears on page 209.

SOUTHERN ANTECHAMBER. None beyond the very slight increase in diameter of the vertical shaft, E, which hardly seems to merit classification as an antechamber. See page 209, for a full discussion of this point.

FLOOR. Adobe plaster over bedrock.

FIREPIT. A, roughly round, no adobe collar.

DEFLECTOR. None found in place; slot B in the floor south of the firepit may safely be assumed to have once held an upright slab deflector.

SIPAPU. None found.

POST HOLES. Four roof-support posts, D, the southern pair apparently incorporated in the partition walls. They were much shallower than those in other pit houses. The depths ranged from 16 to 20 centimeters. No pebbles were found in them. The northern pair was very close to the wall, in fact tangent to it. In all other pit houses at the site, except Pit House N, where this type of post hole did not occur at all, the holes are set in a considerable distance from the main wall. The reader will notice that in other items as well as this one the builders of this pit house seem to have made much less than the usual effort to conform to regularity.

OTHER FLOOR HOLES. Again Pit House J stood out as different from the others. The usual galaxy of pot holes and floor pits in the main section was entirely lacking. The firepit and 2 post holes were the only excavations in the floor. In the south end one irregularly shaped pot hole, C, 20 centimeters in diameter and 8 centimeters deep was found, filled with ordinary refuse material, directly north of the tunnel opening.

WALL NICHES. None found.

TAXONOMIC POSITION. Pit House J was used and abandoned during the Abajo Phase, since the pottery on the floor and extending to the surface of the fill belonged to that phase as defined. It is presumed to have been late in the phase because of: (a) the tunnel system replacing passageway and southern antechamber; (b) the absence of pot holes and other holes in the floor of the main room. Both of these characteristics may be interpreted as progression toward the architectural style of the San Juan kiva.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci.

PIT HOUSE K

LOCATION. Site 13; between Plazas II and III; underlying storage rooms 6 and 12 and living rooms 6A and 12A.

MAPS AND PLANS. Figs. 27, 40.

PHOTOGRAPH. Fig. 97, *d*.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Potsherds: figs. 103, *o*; 101, *bb*.

TYPE. Type I, shallow pit house.

SHAPE. Two walls approximately straight, 2 walls curved, corners rounded.

ORIENTATION. Slightly east of north.

FILL. Refuse, containing many potsherds.

WALLS. Undisturbed native earth plastered with adobe. Along the north wall was indication of a shoulder as in Pit House H with butt ends of posts lying down pointing inward. No post holes were found. Perhaps posts rested on this shoulder to form the upper part of the wall. This point is discussed fully on page 207.

PARTITION. Discontinuous; 2 wing walls of upright slabs incorporating 2 roof-support posts. Only 1 slab remained of the eastern wing but more slabs probably existed to the west of the post hole. An adobe ridge ran from the eastern end of the west wing to the firepit.

SOUTH END. Commodious; upright slabs still standing on the west side suggest that there might have been a large bin at this end. There was no change in floor level.

PASSAGEWAY. None; a doorway connected the south end with the antechamber. The sill of the doorway was made of adobe mud (fig. 97, *d*). On the south side of the door sill was a slight shoulder (*B'*, fig. 40). At either end of the sill was a post hole, G. These probably carried a roof over the doorway. The rest of the division between the main room and the antechamber was of undisturbed red earth. The original ground level was little, if any, higher than the top of the sill. Subsequently the south walls of rooms 6 and 12 were built on the fill covering this feature (see D, fig. 40).

SOUTHERN ANTECHAMBER. Walls slightly curved, corners rounded, smooth hard-packed adobe floor, 4 corner posts tangent to or partly set back into the walls. This room was smaller than the antechamber of Pit House H but large enough to be a useful room. No pot holes or pits were found in the floor. The floor level was considerably higher than that of the main room.

FLOOR. Adobe plaster over bedrock in the main room; adobe plaster over undisturbed earth in the antechamber.

FIREPIT. Oval with the long axis north-south. Well plastered. This plaster shows up so well in figure 97, *d* that it suggests an adobe collar, but none existed. The plaster immediately surrounding the firepit was well baked and consequently has held together better than that elsewhere on the floor.

DEFLECTOR. None found.

SIPAPU. None found.

POST HOLES. Four main roof-support posts, F. Three of them were 20 to 22 centimeters in diameter and 40 to 52 centimeters deep. The southwestern one,

centimeters in diameter and extended down approximately 50 centimeters below the top of the sill.

Two small holes, M and N, 8 to 10 centimeters in diameter and 30 centimeters deep, near the north-

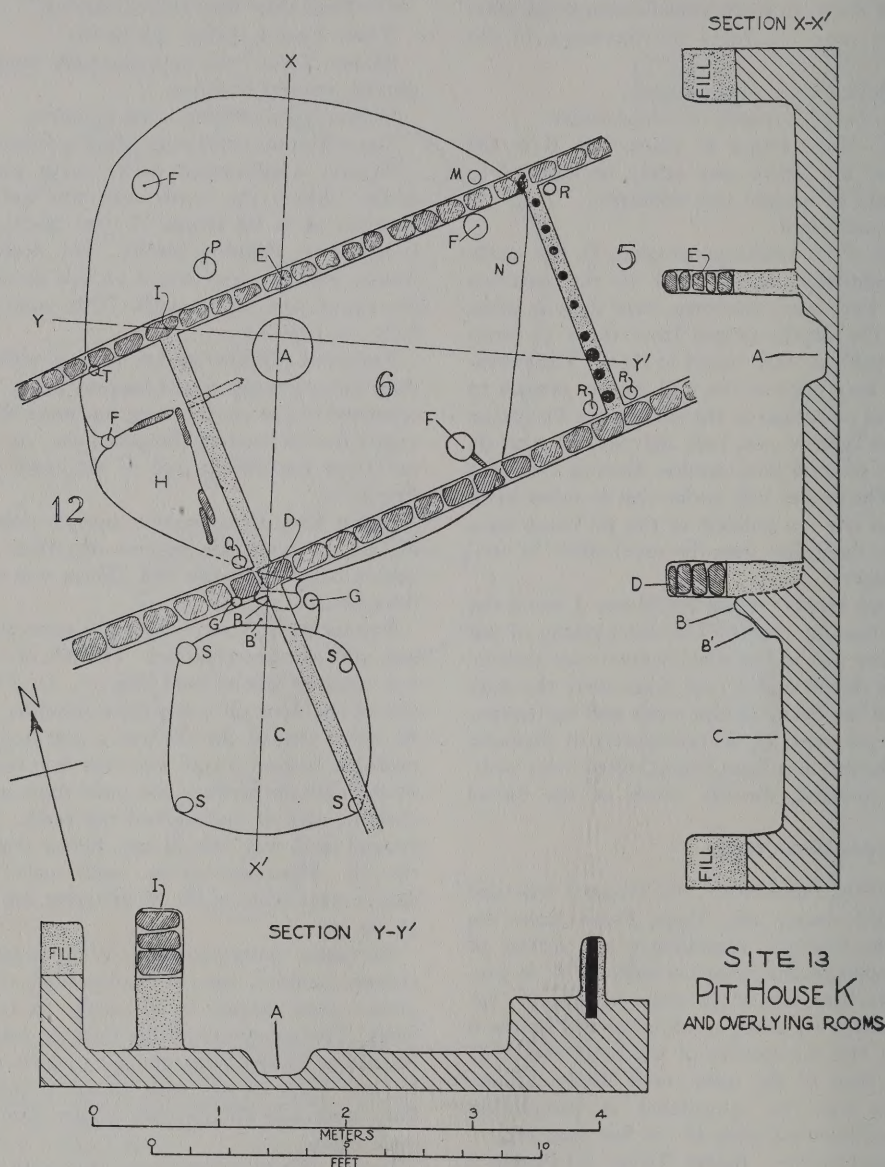


FIG. 40. Ground plan and cross sections, Pit House K, and Rooms 6 and 12, Site 13, Alkali Ridge.

at the western end of the western wing wall was set in a projection of natural, undisturbed earth marking the beginning of the wing wall and was only 10 centimeters in diameter.

In the antechamber the corner posts were 10 to 16 centimeters in diameter and 28 to 32 centimeters deep. The posts G flanking the door sill were 10 and 12

centimeters in diameter and extended down approximately 50 centimeters below the top of the sill. A similar hole, T, occurred along the west wall. Hole Q in the south end was 10 centimeters in diameter and contained remnants of a post. From its position on the plan it might appear to be merely the corner post of later Room 12, corresponding to posts marked R in Rooms 5 and 6. Such was

not the case. The post in this corner of Room 12 had been removed at a higher level during excavation.

OTHER FLOOR HOLES. Floor pits were singularly rare. Except for the main firepit, roof-support poles,

earliest pit houses on the site. The ground plan and 2 cross sections in figure 40 show the manner in which Rooms 6, 12, 6A, and 12A overlie it. Their walls were built upon fill in Pit House K. It also presents more

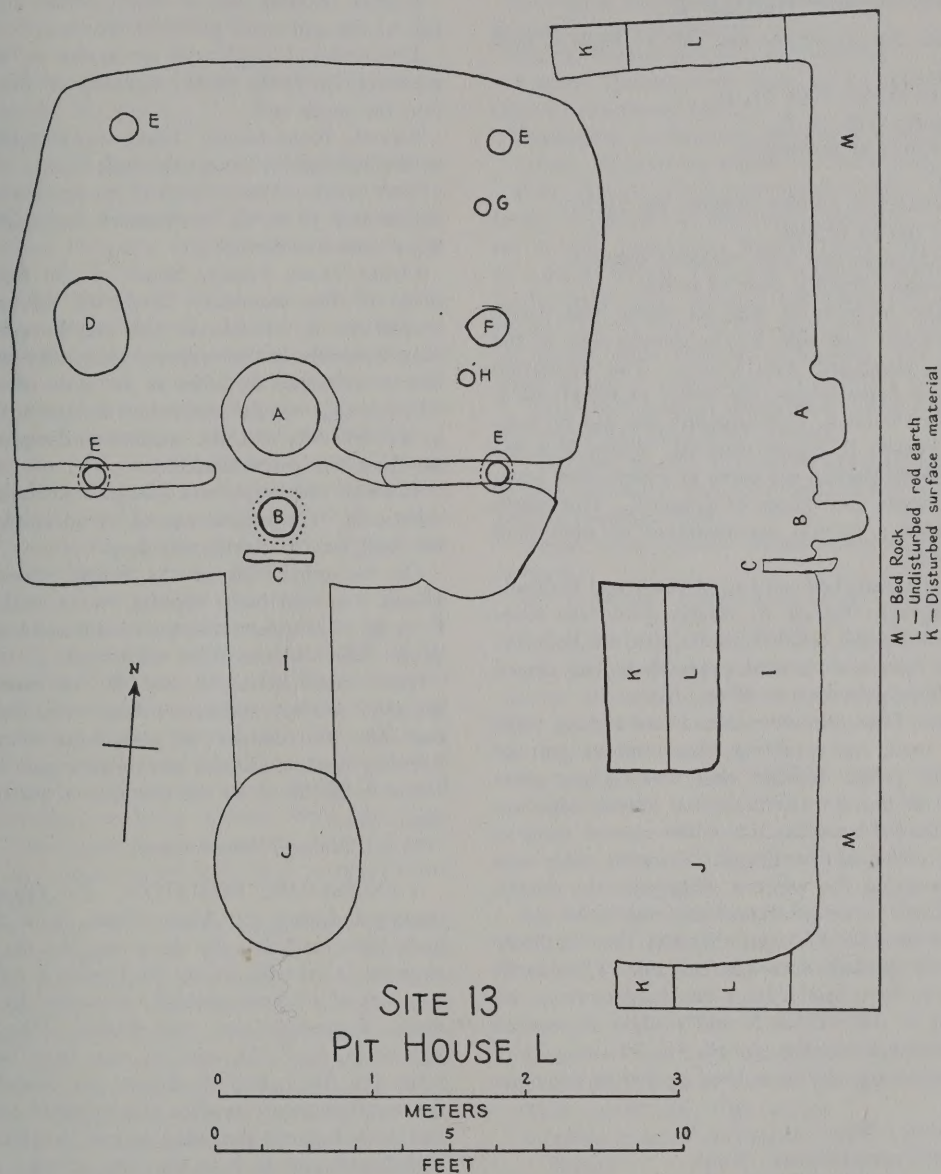


FIG. 41. Ground plan and cross section, Pit House L, Site 13, Alkali Ridge.

and the 3 other post holes, the only floor hole was a small pot hole, P, filled with sand, 24 centimeters deep between the firepit and the northwestern post hole.

WALL NICHES. None found.

TAXONOMIC POSITION. With Pit Houses H and I this is considered to have been one of the 3

similarity to Pit Houses H and I than it does to any of the Type II and Type III pit houses. The sherds found on the floor and in the fill were all of Lino Gray and Abajo Red-on-orange type with no Lino Black-on-white.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases.
MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-
Abajo Foci.

PIT HOUSE L

LOCATION. Site 13, at the east side of Plaza I, west of Kiva 2.

MAPS AND PLANS. Figs. 27, 41.

PHOTOGRAPH. Fig. 98, *b*.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Drawings of pottery designs: fig. 74, *d*.

TYPE. Type II, variant.

SHAPE. Quadrilateral with rounded corners.

ORIENTATION. Slightly west of north.

FILL. The location of this pit house was partly overlain, on the west side, by the eastern edge of the refuse area associated with Unit I. The deposition of this refuse began before the cavity of Pit House L was completely filled. Consequently the top fill consisted of Pueblo II refuse material. Below this the fill was of hard-packed red earth in which were occasional potsherds and pieces of charcoal. This seems to have been a natural accumulation of blow-sand and wash fill.

WALLS. Undisturbed native red earth and bedrock. The photograph (fig. 98, *b*) clearly shows the excavation made by the builders down into the bedrock. The walls were not vertical everywhere but sloped inward from the bottom at some places.

PARTITION. Discontinuous; there were 2 wing walls of adobe mud, incorporating the southern pair of roof-support posts. Neither slabs nor upright posts were used in the construction. An adobe ridge extended from the western end of the eastern wing to the adobe collar of the firepit. No such ridge was found connecting the western wing with the firepit.

SOUTH END. In the center of the south end was a bell-shaped cist, B. Between this and the ventilator opening was the deflector. The east side of the south end seems to have been a large bin, judging from the indentation of the wall at K and a slight depression of the floor level (see figs. 41; 98, *b*). The remainder of the floor was at the same level as that of the main room.

PASSAGEWAY. None.

SOUTHERN ANTECHAMBER. None.

VENTILATOR. As in Pit House J, a horizontal tunnel, I, and vertical shaft, J, took the place of a passageway and southern antechamber. Unlike Pit House J, in this case there was no doubt as to whether it was an entrance or merely a ventilator. The smallness of the horizontal tunnel and the proximity of the deflector to the opening into the south end absolutely precluded the possibility of this having been used as an entrance. For a full discussion of this point, see page 206.

The floor of the horizontal tunnel was at the same level as that of the pit house, excavated out of bedrock.

FLOOR. Bedrock covered with a thin coating of adobe plaster.

FIREPIT. Round, with an adobe collar. It was found full of ash and small pieces of charcoal.

DEFLECTOR. Upright slab set in slot in bedrock immediately in front of the opening of the ventilator into the south end.

SIPAPU. None found. There was certainly no hole in the bedrock in the north-south line.

POST HOLES. Four, E; 16 to 20 centimeters in diameter and 32 to 34 centimeters deep. No pebbles were found in them.

OTHER FLOOR HOLES. South of the firepit in the place of the secondary firepit or ash pit a bell-shaped cist, B, was found. This may have fulfilled the same functions as the ordinary pit usually found there, but it contained no ashes at the time of excavation. The opening was 24 centimeters in diameter, the depth 32 centimeters, and the maximum diameter beneath the floor was 30 centimeters.

West of the firepit was a large oval basin, D, filled with sand. The mouth was 64 by 46 centimeters and the hole was 19 centimeters deep.

On the other side of the firepit, where in some houses a second basin appears, was a small pot hole, F, 24 by 26 centimeters at the mouth and 8 centimeters deep. This also was filled with sand.

Two small holes, G and H, 10 centimeters in diameter and 22 centimeters deep, were found on the east side. No remnants of posts were found in them but they resemble in size and location post holes often found in the floor on the east side of pit houses (see page 155).

WALL NICHES. None found.

TAXONOMIC POSITION. Pit House L was occupied during the Abajo Phase. It is thought to have been used late in the phase for the following reasons: (a) the fill, below the Pueblo II refuse on the top, was of material probably deposited by wind and wash, suggesting that this house, along with Pit Houses B, E, F, M, and N, may have been in use when the Abajo part of the site was abandoned; (b) the ventilator shaft in place of a southern antechamber definitely suggests the latter part of the phase; (c) the bell-shaped cist, B, is in the same relative position as a bell-shaped cist in the early Pueblo II kiva at Site 7 nearby.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods. Pueblo II-Pueblo III refuse in the top fill.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases. Refuse from Mancos Mesa, McElmo, and Montezuma in the top fill.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci. Refuse from Mancos and undefined Mesa Verde Pueblo III Foci in the top fill.

PIT HOUSE M

LOCATION. Site 13, Plaza I, east of Rooms 220A and 222A, south of Rooms 211-213.

MAPS AND PLANS. Fig. 27.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: fig. 99, g.

Potsherds: fig. 103, r.

TYPE. Type III.

SHAPE. Round or slightly oval with long axis north-south. Not enough of this pit house was excavated to permit an absolute statement of shape or orientation.

ORIENTATION. Probably slightly west of north, see above.

FILL. Top fill, Pueblo II refuse, down to 72 centimeters along the west wall. From 72 centimeters down to the remains of roof and wall debris on the floor, a space of 30 to 40 centimeters in the vertical section was occupied by broken ledge rock. This was somewhat mysterious until it was realized that Kiva 1 nearby (see plan, fig. 27) had been cut as much as 90 centimeters down into the bedrock. The depression of ruined Pit House M apparently presented a practical place for the deposition of the rock chipped out during the construction of that kiva.

WALLS. Native earth. The circumference of the main room north of the partition wall, as far as it was excavated, presented a series of post holes similar to those found in Pit Houses B and E. The holes were 18 to 30 centimeters apart and the posts in them had apparently slanted inward toward the main roof as in the other 2 large pit houses. Again, as in Pit Houses B and E, there was an adobe apron against the wall but no horizontal wedging timbers were found beneath it. The apron was 16 centimeters wide and sloped up to a point on the wall 18 to 20 centimeters above the floor.

PARTITION. Only the western wing of the partition wall was excavated. This was found in excellent preservation, still standing to a height 104 centimeters at its highest point. It was made of 4 upright posts 6 to 8 centimeters in diameter and also incorporated one of the main roof-support posts, the whole plastered with adobe mud to form a wall 18 to 20 centimeters wide. The eastern end of this wing was very carefully and smoothly rounded. It was connected with the central firepit by means of an adobe ridge 6 centimeters high.

The nature of the remainder of the partition is unknown. There was no door sill, as in Houses B and E, at the eastern end of the west wing. It is probable that there was a central section south of the firepit, but this was not ascertained by excavation.

SOUTH END. Only the western part was excavated. This consisted of a large bin made by the installation of an adobe wall between the eastern end of the western wing of the partition wall and the main south

wall. This wall was narrower than the partition wall. It was 14 to 16 centimeters wide and had 1 post near the middle 8 centimeters in diameter.

PASSAGEWAY. Unknown; not excavated.

SOUTHERN ANTECHAMBER. Details unknown; located in test but not excavated.

FLOOR. Adobe plaster over bedrock.

FIREPIT. Round, with slight adobe collar not more than 3 centimeters high.

DEFLECTOR. Unknown; region not excavated.

SIPAPU. Unknown; region not excavated.

POST HOLES. Two main roof-support posts were found in the part of the house excavated. They were set in such position as would justify the postulation of a 6-post set-up. One was in the partition wall, one in the main floor. Charred posts remained in both of them. Like so many of the main posts in Alkali Ridge pit houses, these were set in pebbles. The post holes were 26 and 28 centimeters in diameter and the posts 14 and 15 centimeters respectively. The remainder of the space was filled with pebbles.

The other groups of posts in the partition wall and around the outer wall have been described under the proper headings above.

OTHER FLOOR HOLES. None found in the area excavated.

WALL NICHES. None found in the area excavated.

TAXONOMIC POSITION. Believed to be one of the pit houses occupied and abandoned at the conclusion of the Abajo Phase and one of the 3 latest built at the site. The reasons for this are the same as those given for Pit House B.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods. Pueblo II-Pueblo III refuse in the top fill.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases. Refuse from Mancos Mesa, McElmo, and Montezuma Phases in the top fill.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci. Refuse from Mancos and undefined Pueblo III Mesa Verde Foci in the top fill.

PIT HOUSE N

LOCATION. Site 13, Plaza I, directly south of Room 199 near end of north row of storage rooms.

MAPS AND PLANS. Figs. 27, 42.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Potsherds: figs. 101, w; 103, n, s; 107, e; 108, c; 165, l-o, q.

Objects of stone: fig. 47, m.

Objects of bone: fig. 177, e.

TYPE. Hard to classify. Type II, variant, is probably the best classificatory description.

SHAPE. Roughly circular. This was the smallest pit on the site which seemed definitely to be a house.

ORIENTATION. Uncertain: features were not sufficient for positive determination of the axis on which

this observation is based in the other pit houses. If the indentation F is taken as homologous with the usual southern antechamber or ventilator, the orientation would be considerably west of north.

FILL. Top fill, refuse with heavy ash content. Below this was a red earth fill, apparently a natural accumulation of blow-sand and wash, in which were a few potsherds.

WALLS. Undisturbed native red earth. Although vertical in some places, in others the wall sloped inward from the bottom.

which from his photograph⁶⁴ closely resembles this.

FLOOR. Bedrock covered with adobe plaster.

FIREPIT. A, round, full of ash, no adobe collar.

DEFLECTOR. No trace found.

SIPAPU. Hole G, filled with sand, in the north-south axis occurred in the correct location for the so-called sipapu. If it was such, however, it was of a most unusual shape. The main part of the hole was a round, steep-sided pot hole, 30 centimeters in diameter and 20 centimeters deep. A small oval hole, 3.5 by 8.5 centimeters wide, lay 3.75 centimeters to the west.

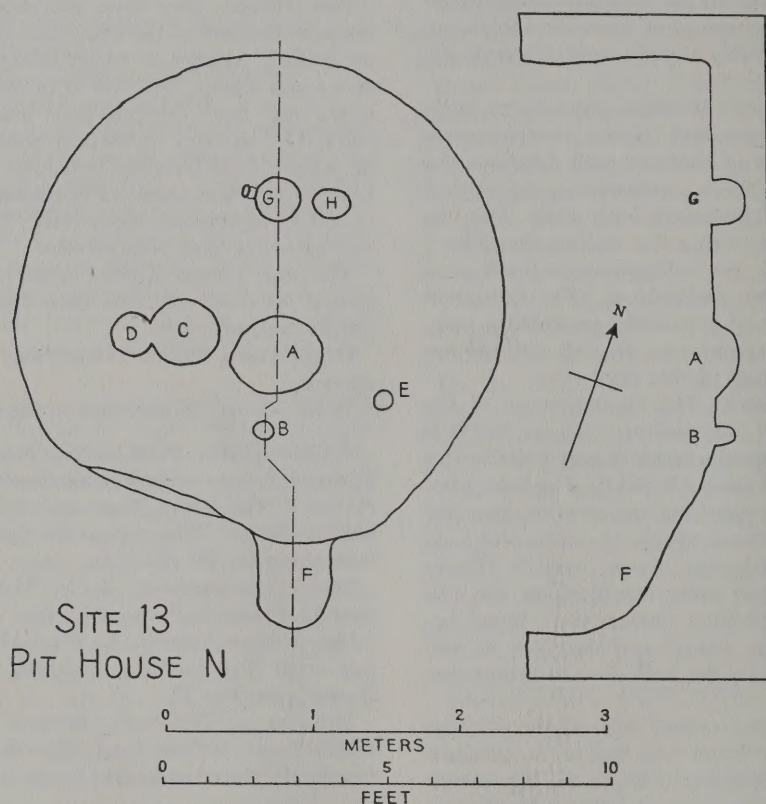


FIG. 42. Ground plan and cross section, Pit House N, Site 13, Alkali Ridge.

PARTITION. None found and no trace of one visible.

SOUTH END. Absent; since there was no partition, there could be no special area designated "south end."

PASSAGEWAY. Absent.

SOUTHERN ANTECHAMBER. Absent; presumably in its place was an indentation, F. The bedrock rose toward the south and the rise was continued in a regular curve in the undisturbed red earth wall to the top of the bay, F (see fig. 42, cross section). Whether this was an entrance or a ventilator or both could not be determined. No trace of built-in structure was found. Martin's Subterranean Pit F at Ackmen-Lowry Site 2, across the Colorado line, had an indentation

This was connected to the main pot hole by an angular shaft. The opening in the west wall of the pot hole was 6 centimeters in diameter. The bottom of this opening was 10 centimeters below the floor level.

Hole G seems to have been similar to the 3 holes, G, Q, and, particularly, N, called possible roasting pits, in Pit House B. The arrangement of those holes in House B has been discussed as possibly of ceremonial significance (p. 164). Only by correlating hole G with that highly equivocal argument can it be considered as a possible sipapu.

POST HOLES. None found.

OTHER FLOOR HOLES. South of the firepit was a

⁶⁴ Martin and Rinaldo, 1930, fig. 98.

small round pot hole 14 centimeters in diameter and 13 centimeters deep with a red earth fill. West of the main firepit, A, were 2 intersecting pits, C and D, which, like the firepit, were full of ashes. Hole C was 45 centimeters wide and 10 centimeters deep. Hole D was 28 centimeters wide and 12 centimeters deep. Hole E was a small pot hole 12 centimeters in diameter and 5 centimeters deep, full of sand. Hole H, east of hole G, was an oval pot hole 20 by 26 centimeters wide and 8 deep with a sand fill.

WALL NICHES. None found.

TAXONOMIC POSITION. Used and abandoned during the Abajo Phase. Whether it was early or late in the phase is unknown. However, a number of features indicate lateness: (a) absence of southern antechamber; on the other hand, there was no ventilator either so that this lack does not necessarily relate it to later structures; (b) absence of south end; on the other hand, it was a very small pit, and also, some sort of partition, since destroyed, marking off a south end, may once have been present; (c) hole G, which may be a roasting pit, was similar to those in the floor of the late Pit House B; (d) the red earth fill in the bottom of the pit suggests that it was abandoned at the end of the Abajo Phase simultaneously with Pit Houses B, E, F, L, and M.

PECOS CLASSIFICATION. Basket Maker III-Pueblo I periods. Pueblo II-Pueblo III refuse in the top fill.

GILA PUEBLO SYSTEM. La Plata-Abajo Phases. Refuse from Mancos Mesa, McElmo, and Montezuma Phases in the top fill.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Lino-Abajo Foci. Refuse from Mancos and undefined Pueblo III Mesa Verde Foci in the top fill.

PIT HOUSES P & Q

MAPS AND PLANS. Fig. 27.

Two other pit houses were located but not excavated. A small test hole was dug in Pit House P, east of Pit House G. The test fortunately encountered a corner, as shown in figure 27. It was truly angular, more so than any other found at Site 13. The depth was that of the Type II and Type III pit houses.

No test was made in Pit House Q, west of Room 295, beyond determination of the presence of fill beneath the surface. It seems probable that there was a pit house there, associated with the short row of rooms running west from Room 120 and corresponding to Pit House D.

STORAGE ROOMS AND GROUND-LEVEL LIVING ROOMS

MAPS AND PLANS. Figs. 27, 28, 43.

PHOTOGRAPHS. Figs. 82, a; 90; 91; 92, a, b, c; 93; 94; 97, c, d; 98, c, d.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 99, a-e, b-l, n-bb, dd, gg-ll; 100, a-c, e-j, l, n-p; 102, n; 104, a, c-g, i, j; 105, a-e, g-l; 110, a, c; 111, e; 191, g. Potsherds: figs. 101, a, d, f, j, k, n-r, t-v; 102, b, e-g, j, m; 103, c, e-i, m, q, u, w, y, z, cc; 106, a-c, f; 108, a; 109, a-c; 110, d, f, h, j, k, m, o-r; 142, d; 151, a, b; 165, a, b, d, f, g, i-k, p, r.

Drawings of pottery designs: figs. 52, a-c, e-i, k, m, n, p, r-t; 53; 54, a-c, e, f; 55; 56, a, c-e; 57; 58, a-e; 59; 60; 61, b, c, e, f; 62; 63; 64, a, c, d, f; 65, a-c; 66, b-f; 76, e.

Miscellaneous clay objects: fig. 175, a, b.

Objects of stone: figs. 47, e, l, o; 48, a, b, d, l, m; 49, d, g, j; 50, a, b, f; 51, b, m; 170, d, e, g-k; 172, c, e-g, p, q, t, u; 173, b, c, e, g, i; 174, e.

Objects of bone: figs. 177, a, d, g-i; 178, b, e, f, h, i, l, m; 179, a, b, d, f; 180, e; 181, a, b, e, h; 183, b, c; 185, a, c, f-i; 188, b-l; 189, b.

When Mr. Lancaster discovered Site 13 the first things that he noticed were long low ridges, 60 to 80 meters in length, covered with occupational debris, in the rather thick juniper growth of that part of the mesa. The surface indications included small stones and a large quantity of brick-hard lumps of adobe. Because of the appearance of the surface these ridges were, at first, thought to be the remains of a very large village of post-and-adobe houses such as the houses at Sites 9 and 12.

The surface potsherds, however, were quite different from the sherds at those sites. Except in the vicinity of the house mounds of obviously late units at the northern part of the new site, sherds of neither black-on-white nor corrugated pottery were found. Instead the sherds were the remains of plain gray vessels or of bowls and jars of orange base-color with designs painted in red.

Excavation revealed that these ridges represented long rows of contiguous small rooms, roughly rectangular, arranged in a gentle curve until the west end was reached, where the rows either curved sharply to the south or abutted a north-south running row of similar rooms. The north row ran directly under the later Unit 1 house and thereby provided a stratigraphic relationship with Pueblo II. Two short rows were also found running to the west from the north-south row.

In front of each row of small rooms, and attached to it, was another row of rooms, considerably larger, for the most part. They dif-

ferred from the smaller rooms in more ways than in size. From structural features and contents the conclusion was reached that the large rooms were living quarters while the small rooms were storage chambers.

A few examples were found of isolated small pits which may have been storage chambers associated with the earliest pit houses and preceding the contiguous granaries which formed the long rows.

The site map, figure 27, shows the arrangement of rooms and the positions of pit houses in relation to them. It also shows the splendid stratigraphy we were fortunate enough to find which places the long rows of rooms between early or Type I pit houses and small coursed-masonry units of Pueblo II type. Rooms 6, 6A, 12, and 12A were built on top of Pit House K; Rooms 14, 14A, 15, and 15A were built on top of Pit House I; while, on the other hand, Rooms 205, 206, 207, 208, and 209 ran beneath the later Rooms U₁, U₂, and U₃.

The discovery of this site holds many significant implications for the history of Pueblo architecture. Perhaps the most important of these is the appearance of large accumulations of contiguous rooms assembled around open plazas in which were placed subterranean structures, all of this antedating the small "unit-type" dwelling supposed to have been the "germ" of Pueblo village form. The few tree-ring dates obtained place the buildings in the eighth century A.D.⁶⁵ The unpainted pottery associated with them, with the exception of a very small fraction of 1%, was of the type diagnostic of Basket Maker III in the Pecos Classification. The painted pottery was of a new "type" of red paint on an orange background, with designs more closely resembling the decorative designs on Basket Maker baskets than any pottery designs previously found. The wall construction included all of the major types previously described for the San Juan: walls of upright slabs, of post-and-adobe (jacal), of horizontal coursed masonry, and of simple adobe. Fortunately, minor details in the fabrication of these walls distinguished them from walls of other times and in other localities which otherwise may be classified in the same broad types.

Consequently, we have on Alkali Ridge a

⁶⁵ See pp. 90-91.

"pueblo" antedating by 300 to 500 years the large villages of the Pueblo III period and presenting a large number of diagnostic Basket Maker III traits in the architecture and minor artifacts.

The pit houses of Site 13 have already been described. The following pages will be devoted to the ground-level buildings. On the bases of form and function 2 kinds of rooms can be distinguished. Although they were adjacent, in the same buildings, the storage chambers and living rooms will be described separately.

Storage Chambers. One hundred and eighteen storage chambers were excavated, most of them completely. At least 10 more were present at the site. They were arranged in long rows as described above and as shown in figures 27; 90; 92, *c*; 94, *c, d*. The general range in size was from 1½ meters square to 2 meters by 4 meters. A few, such as Rooms 251, 294, and 295, were smaller than this, but these seemed to have been the result of partitioning of rooms subsequent to original construction. The rows, although generally curving, were approximately straight in some sections, particularly in the alignment of the southern end of the north-south row. Part of the curve was produced by very slight angles at abutment points between rooms, but some of it was to be found in the walls themselves. However, the curve was so gradual in most places as to be hardly perceptible in the individual rooms which, when viewed singly, appeared rectangular or very slightly trapezoidal.

Excavation revealed walls still standing at a height of from 30 to 120 centimeters. Most parts of the site had been destroyed by fire, and the rooms were filled with hard-baked adobe from the walls and roof, broken pottery, charred timbers, charred corn, beans and pinyon nuts, manos and metates. Most of the manos and metates and some of the decorated pottery occurred high in the burned fill amidst and above the adobe and charred timbers which had originally been the roof, suggesting quite definitely that they had been on top of the building at the time of the conflagration.

The floors, hard-packed and usually burned, were as a rule 8 to 15 centimeters below the

original ground level. The rooms were not, however, of equal depth, some being more than 30 centimeters deeper than the usual run, so that, although they are classified as above-ground rooms to distinguish them from pit houses, the floors were actually sunk slightly into the earth.

The reasons for labeling these contiguous structures as storage rooms are as follows:

1. The nature of the contents, listed above. The amount of corn and beans was indeed vast, with occasional caches of pinyon nuts and other seeds.
2. The smallness of the rooms when considered as domiciles.
3. The entire absence of firepits in the floors.
4. The presence of larger rooms, with definitely domiciliary characteristics, directly out-side of and attached to them.

WALLS. The walls of the storage rooms may conveniently be divided into 5 construction types, as follows:

TYPE I (figs. 90, *c, d*; 92, *c*; 93, *a, b*). Upright slabs, 3 to 10 centimeters thick, 20 to 48 centimeters wide, heavily plastered, standing to a height of from 40 to 70 centimeters; above the slabs were alternating courses of small, slender stones and adobe mud; the mud course was usually 8 to 12 centimeters in height and often in the form of "adobe turtlebacks." The name "turtleback" indicates the way in which the adobe mud was laid on.⁶⁶ In burned rooms turtlebacks were occasionally found intact, rounded on top and flat or concave on the bottom, sometimes bearing the impressions of the stones which had been above and below them in the walls. The stones in these courses were very oddly shaped in comparison with stones in later coursed-masonry buildings. They were long and narrow, as a general rule, or, if short, still very narrow. Most of the stones ranged from 15 to 30 centimeters in length, 4 to 15 centimeters in width, and 4 to 8 centimeters in thickness.

Thus the part of the wall above the base slabs was an approximation to true coursed masonry. It was, in fact, a coursed wall, but as half of the courses were made up of cakes or layers of adobe mud, and as the mud rather

than the stone provided the body of the wall, it cannot be designated coursed-stone masonry in the established usage of that term.

TYPE II (fig. 93, *c*). Similar to Type I but with 2 tiers of upright slabs, of from 15 to 30 centimeters in height.

TYPE III (fig. 93, *b*).⁶⁷ Same as Types I and II but with slabs omitted; the alternating stone and adobe construction began at the base of the wall or at ground level.

TYPE IV (fig. 93, *d*). Walls of upright posts and adobe mud; no wattle work or cross withes; grass, reeds, and small leaves used as a binder in the adobe. The Type IV walls differed markedly from post-and-adobe walls of Pueblo II houses in that the small poles and stones found in the jacals at Sites 9 and 12 were not present. The Type IV walls consisted simply of upright posts, set into the ground, with adobe mud plastered around and between them. No cross poles or ties were found, although such construction was found in the wall of the partition marking off the south end of the main room of Pit House B. The diameters of the posts in these walls varied from 4 to 10 centimeters, and they were set from 8 to 22 centimeters into the ground. The distance between posts varied from 5 to 25 centimeters.

TYPE V. Plain adobe walls without stone or wood reinforcement; binder the same as in Type IV. No evidence of turtlebacks was found. Most of the rooms with this kind of wall, however, had not burned and the adobe had, in part, reverted to its natural condition so that it can not be assumed that turtleback construction was not used.

The order of popularity of these walls was: Type I, Type III, Type V, Type IV, and Type II. Type I was the most common, and it seems to have been the earliest to appear. It bore the closest resemblance to the walls of isolated Basket Maker III storage chambers described and illustrated by Roberts.⁶⁸ Going even farther back, Type I walls bore the closest resemblance to the storage cists of Basket Maker II described and illustrated by Nusbaum and by Kidder and Guernsey.⁶⁹ Furthermore, in only one part of the site were the walls of storage rooms all of one type. This

Harrington, 1927, pl. XXXV, b.

⁶⁸ Roberts, 1929.

⁶⁹ Nusbaum, Kidder, and Guernsey, 1922; Kidder and Guernsey, 1919.

⁶⁶ A description of Basket Maker turtlebacks is to be found in Kidder-Guernsey, 1919, p. 42.

⁶⁷ Walls of this type were very common at Pueblo Grande in Nevada. A good illustration is given in

was in the north part. All rooms from Room 245 north had Type I walls. The ground was slightly higher there than elsewhere, with the slope running down from it on all sides, and it may have been the site selected for the first building of this phase for that reason. The evidence, however, is far from conclusive. Study of pottery and other objects found in the storage rooms has failed to show any distinctive features which could be accepted as evidence of greater age for this part of the site.

Only 12 walls were of Type II. They seemed to be merely variations of Type I.

Type III was the second most common type of wall, and it was found more often in the outer walls than in the partition walls between the storage rooms. It is presumed to have come into use for the whole wall after it had been developed as the super-structure above the slabs in Type I walls.

Type IV walls were found occasionally in all parts except north of Room 245. Unlike the Type III walls, these were found more often in the partition walls between rooms than in the outer walls. They are presumed to have been introduced later than Type I walls. No sufficient basis was found for presumption of their chronological relationship with Type III walls.

Type V walls were found in all parts of the site. They play a prominent part in only one section, Rooms 81-86.

One of the strangest things about this site, to one who had read of Southwestern house type in terms of slab walls for Basket Maker III, post-and-adobe walls for Pueblo I, and coursed-masonry walls for later periods, was the occurrence of these types not only in a single phase of one site but also in the walls of a single small room, and, in the case of slabs and horizontal courses, even in a single wall. An examination of the following list of storeroom wall types will show that, of the rooms in which all 4 walls could be classified, 9 rooms had 3 types of wall, 37 rooms had 2 types, and 40 rooms had a single type, the same in all 4 walls. The latter were divided into 22 Type I, 2 Type II, 12 Type III, 2 Type IV, and 2 Type V.

The storerooms will now be listed in numerical order with the walls classified according to the types defined above.

The walls, whichever type of construction was used, were very thin, but 10 to 20 centimeters thick, including the plaster. Many of them were under 15 centimeters in thickness.

A question mark indicates that because of weathering, prehistoric remodeling, or lack of excavation the wall could not be classified.

Room	WALLS				Room	WALLS			
	N	E	S	W		N	E	S	W
1	II	II	II	II	88	III	III	III	III
2	II	II	II	II	89	III	III	III	III
3	II	?	II	II	90	III	?	?	?
4	I	II	I	I	98	?	III	?	III
5	III	III	III	IV	99	V	III	III	III
6	III	IV	III	IV	100	III	III	III	I
7	?	V	III	III	101	I	I	III	III
8	III	III	III	V	102	I	III	III	III
9	?	?	I	III	103	IV	III	V	III
10	?	I	I	?	104	V	III	III	III
11	?	I	?	I	105	III	III	V	III
12	III	V	III	I	106	III	III	III	IV
13	I	III*	V	III	107	V	IV	V	IV
14	III	III	III	III	108	IV	IV	IV	IV
15	III	III	III	III	109	IV	IV	IV	IV
16	III	III	III	III	110	III	IV	III	I
17	III	III	III	III	111	III	I	III	I
73	I	?	?	I	112	III	III	I	III
74	I	I	I	I	113	I	III	V	III
75	I	I	I	I	114	V	III	I	III
76	I	I	I	I	115	I	III	I	I
77	?	I	I	?	116	I	I	III	I
80	III	?	III	III	117	III	I	III	I
81	V	III	V	III	118	III	III	III	IV
82	V	III	III	V	119	III	?	?	IV
83	I	V	I	V	120	I	IV	I	I
84	V	V	V	V	121	I	I	I	I
85	V	V	V	V	122	I	IV	V	?
86	I	V	I	I	123	V	IV	III	IV
87	III	III	III	III	125	III	III	III	V

* Double wall between Rooms 12 and 13; Type I on east side, Type III on west side; wall not unusually wide, however.

Room	WALLS				Room	WALLS			
	N	E	S	W		N	E	S	W
198	I	?	?	I	239	IV	IV	?	?
199	I	I	I	I	240	IV	IV	IV	IV§
200	III	I	III	I	241	V	IV	IV	IV
201	III	I	I	I	242	I	I	V	I
202	I	I	I	?	243	I	I	I	I
203	I	?	I	I	244	I	I	I	I
204	I	I	I	?	245	I	I	I	I
205	?	?	I	I	246	II	I	II	II
206	?	I	I†	I	247	III	II	?	III
207	I	I	I	I	248	I	III	III	V
208	I	I	I	I	249	III	V	III	III
209	I	I	I	I	250	III	III	?	I
210	I	I	I	I	251	?	I	?	III
211	I	I	I	I	252	?	III	?	?
212	I	I	I	I	292	III	?	III	III
213	V	I	I	I	293	III	III	III	III
214	I	I	I	I	294	III	III	III	V
215	I	?	?	?	295	III	V	III	III
216	?	I	I	I	296	III	III	III	III
217	I	I	I	I	297	III	III	III	III
218	I	III	I	I	298	III	III	III	III
219	I	I	I	†	299	III	III	V	?
220	I	I	I	I	300	V	III	III	III
221	I	I	I	I	301	III	III	III	III
222	I	I	I	I	302	III	III	III	V
223	I	I	I	I	303	III	III	?	III
224	I	I	I	I	304	III	?	?	III
225	I	I	I	I	305	?	?	?	?
238	?	I	III	I	306	?	III	III	III

† A coursed-masonry wall has been layed in outside the south wall of Room 206.

‡ Room 219: north half of west wall, Type III; south half, Type I.

§ Room 240: inner west wall, Type IV; outer, Type I.

CORNER POSTS. With the walls so thin extra support was necessary for the roof, and in most rooms a post was set into the floor in each of the 4 corners at a slight distance from the walls. Occasionally in unusually long rooms auxiliary roof-support posts were found along the walls, as in Room 107. In rare cases the

roof-support posts were incorporated in the walls. The posts varied from 8 to 20 centimeters in diameter and were set 12 to 32 centimeters into the ground. Occasionally there was a small flat slab set in the bottom of the post hole so that the butt of the post rested on it. In 2 rooms, Rooms 84 and 208, the sides of the post holes were slab lined, as well, but no evidence was found to indicate the nature of the material which must have been packed around the posts to hold them upright in these boxes.

The interiors of the walls were covered by a thick coating of plaster. The surface treatment of this plaster was as variable as the construction of the walls themselves. Sometimes it was merely smoothed down; sometimes it was marked by the application of finger ends, with or without a slight pinching; sometimes it was decorated with parallel oblique strokes of a blunt instrument; and in one case, at least, a corn cob with the kernels still on it had been drawn over the surface leaving small, irregularly spaced ridges. In the last instance the true nature of the instrument used was revealed at the end of each stroke where the impressions of the individual kernels were clearly discernible.

ROOM GROUPS. As has been shown above, the room walls presented a considerable range of variation in materials and methods of construction, of which only the most striking have been listed. One of the more interesting and instructive parts of the study of the site lies in the interpretation of significant variations within this range. In any quarter the wall construction varied regularly by groups of storerooms, in the following manner. The 2 or more storage rooms adjacent to a single living room often had walls built according to one style. The next group on either side was sometimes quite different. This apparently was a variation in individual technique or family fashion. Although wall construction in some sections was too uniform to permit the entire site to be divided in this way, certain general conclusions can be drawn. It seems that, while the rooms were all parts of a structure of contiguous elements, they were built and occupied in groups of 2 to 4 storerooms in association with and adjacent to 1 or 2 living rooms. This is identical with the custom in Hopi Pueblos today.

ROOFS. Judging from the charred fragments often found in the fill of the storage rooms the roofs were flat. Two poles 10 to 15 centimeters in diameter were supported by 4 corner posts. These 2 poles usually ran the long dimension of the room. Smaller poles, savinos, were laid across these, close together or touching. On top of the savinos a mass of sage and other small brush was placed and the latter was covered by adobe mud. There was no evidence to indicate a second story except the presence of implements and pottery in the fill in such association with the roof debris as to suggest that these articles had been on top of the roof. This may be interpreted as evidence for a second story, by assuming that the articles had been on the floors of the upper rooms. The lightness of wall construction and the small amount of wall and ceiling debris indicate, however, that the assumption that the articles were in the open on the roof of the structure is more logical. It corresponds with modern Pueblo custom of performing household tasks on the roofs.

CISTS AND BINS. Small bins, presumably for some special form of storage, occurred frequently in the storerooms. Twenty-seven cists and bins were found in these rooms. Except for a cist in Room 199, cists were never more than 20 centimeters in diameter and showed no evidence of having been firepits. The cist in Room 199, which was 60 centimeters in diameter, may have been associated with one of the later units of Pueblo II and Pueblo III times. This is thought probable because 2 other cists, one a large basin (see fig. 27), had been cut down into that room, and part of the north wall had been removed in the process.

The bins, of which twelve were found, usually occurred in the corners of the storerooms and were made either of adobe or of adobe and upright slabs. They were between 30 and 60 centimeters in height when found, but some of them may have been higher originally. The bin in Room 118 was full of corn, and a jar was found in one bin. Otherwise there were no indications of the use to which they were put.

FIREPITS. Firepits were found in only one of these rooms, Room 110, which had 3 of them. They were full of ashes and showed definite evidence, in the burned side walls, of having been used as firepits.

DOORWAYS. Only 2 definite doorways were found, but there were indications of many others. A good doorway was found between Rooms 113 and 114. It had a heavy adobe sill 30 centimeters above floor level. The sill projected 30 centimeters out into Room 114 with a single post encased in adobe under it. Beneath the sill the projection was faced on one side with an upright stone slab.

Another doorway was found, this time at floor level, between Room 101 and living room 100A (fig. 92, *a, b*). It was 42 centimeters wide with an adobe sill 12 centimeters high. Directly to the east of it was a small, round hole 24 centimeters in diameter; similar to the hole, of unknown use though possibly for ventilation, found beneath or beside doorways in the pit houses. Both the door and the hole were plugged with adobe when found.

Outside the wall of Room 101 was a contrivance, examples of which were found elsewhere at the site, which has been interpreted as indicating the presence of a doorway at a higher level, probably the successor to the plugged doorway (fig. 91, *b*). It was a structure very like the projection of the door sill in Room 114 described above. The projection came about the same distance into the room, 30 centimeters, and it was made in the same manner by encasing a short post in adobe and facing the protuberance with 3 upright stone slabs. The top of the structure was flat and was of just the right height to serve as a step for a doorway higher in the wall. Furthermore, leaning against the wall beside it was a stone slab 58 by 36 by 12 centimeters, of appropriate size for a "door stone." Other "steps" were found in similar positions, some made of upright slabs and adobe and one made from a pile of worn out manos (hand grinding stones) set in adobe. Indications of these can be seen on figure 27 between Rooms 100A and 101, 245A and 245, 222A and 222, 220A and 220, 220A and 219, 218A and 218, 218A and 217, 214A and 213, and between 117 and the unexcavated living room east of it. These are all approximately in the middle of the walls where the storage rooms abut the living rooms. And in Room 101, in the other side of the wall from the step, was a "toe hole" 40 centimeters above the floor. Upright stone slabs of such size that they may have served as door slabs were found

leaning against the walls of 47 storage rooms, usually against the wall facing the living room. One found in Room 100 was 58 centimeters high by 46 centimeters wide and only 2 centimeters thick. On the basis of this evidence it seems likely that the storage rooms were entered from the living rooms by means of a doorway 60 to 100 centimeters above the floor level of the living rooms.

ROOM FILLS. Particularly in burned rooms, and most of the rooms at the site had burned, much information was gained from the fill on and near the floor. Roof debris has already been described. Some whole pottery vessels were found and many restorable ones. Twenty-four restorable vessels were found in Room 297. Many stone and bone implements were found; much clay, some of it in jars; a considerable amount of seeds and other plant remains including the "berries" of juniper, soapweed, yucca, and prickly pear. The main contents were, however, food staples — corn, beans, and pinyon nuts, with some remains of squash. The amount of corn was tremendous and contributed greatly to the heat of the fires when the rooms burned. In some cases the fire had been so hot that pottery had been vitrified almost beyond recognition.

Despite the predominance of corn and beans in these rooms, it should be emphasized that they were not used only for food storage but apparently for general storage as well. Faint indications of leather and wooden objects were observed but never enough to identify the form. It is to be expected that personal belongings and ceremonial objects were stored in these rooms as well as food, seeds, tools, and containers.

Living Rooms. In front of the storerooms, to the south of the east-west rows and to the east of the north-south rows, were large rooms which gave the appearance of having been living rooms. These are the A rooms on the plan (fig. 27), that is, 100A, 218A, 220A, etc.

In the northern half of the site, where investigations were more thorough than elsewhere, they were found to have had post-and-adobe walls almost exclusively, except for the walls on the storeroom side which belonged to the latter rooms. The living room walls were simi-

lar to the Type IV rooms of the storerooms although sometimes slightly wider. The small remnant of the south wall of Room 240A was Type I. The floors were of adobe mud, rather uneven, and apparently on the original ground level, or only a few centimeters below it.

The size of these rooms is shown on the ground plan (fig. 27). They were much larger than the storage rooms, in fact considerably larger than any of the rooms excavated in the Pueblo II and Pueblo III sites on Alkali Ridge.

Their importance in the development of Pueblo architecture is great, because they provide the first known step in the movement of domiciliary functions away from the pit houses and into rooms on ground level. This theory is supported by the finds in such rooms at Site 13. Stone and bone implements and pottery were found in them in profusion. Nine pottery vessels (one containing "pottery clay"), 3 arrow points, 2 chipped stone "knives," 9 *metates*, and 15 manos were found on the floor of Room 100A. It had a large firepit, 90 centimeters in diameter and 24 centimeters deep, with an adobe collar. The *metates* were troughs, open at one end, in crude sandstone slabs, untrimmed for the most part, similar to those previously found associated with Basket Maker III and Pueblo I.⁷⁰ Room 100A and 7 of its 9 *metates* are shown in figures 92, *a, b*; 174, *e*. Six of the *metates* may be seen as they were found, *in situ*, in figure 91, *b*.

Room 224A had 3 firepits, 2 of them equipped with deflectors. Room 220A had 2 firepits and 1 deflector. The positions of these deflectors suggested an entrance or ventilator in the wall opposite the storage chambers. In 3 of the 4 living rooms where that wall was located gaps occurred in the center. In the one instance, Room 222A, where no gap was found there was also no deflector. The evidence is not conclusive, however. The floors of these rooms are very close to the present ground surface, in some cases in fact above it, so that they have been partly eroded, and it was often impossible to trace the outer wall. Enough instances were found, however, to establish the fact that the rooms were completely walled and that they were not merely open-ended "shelters" or windbreaks.

In the 2 southern rows, where little excava-

⁷⁰ Roberts, 1929; Morris, 1939.

tion was done outside of the storage chambers, the situation seemed to differ somewhat from that in the northern section of the site. Room 82A had a curved wall of upright slabs, includ-

There may have been, in part of this section, a double row of storage chambers such as have been found by Morris and Martin ⁷¹ in similar sites in Colorado.

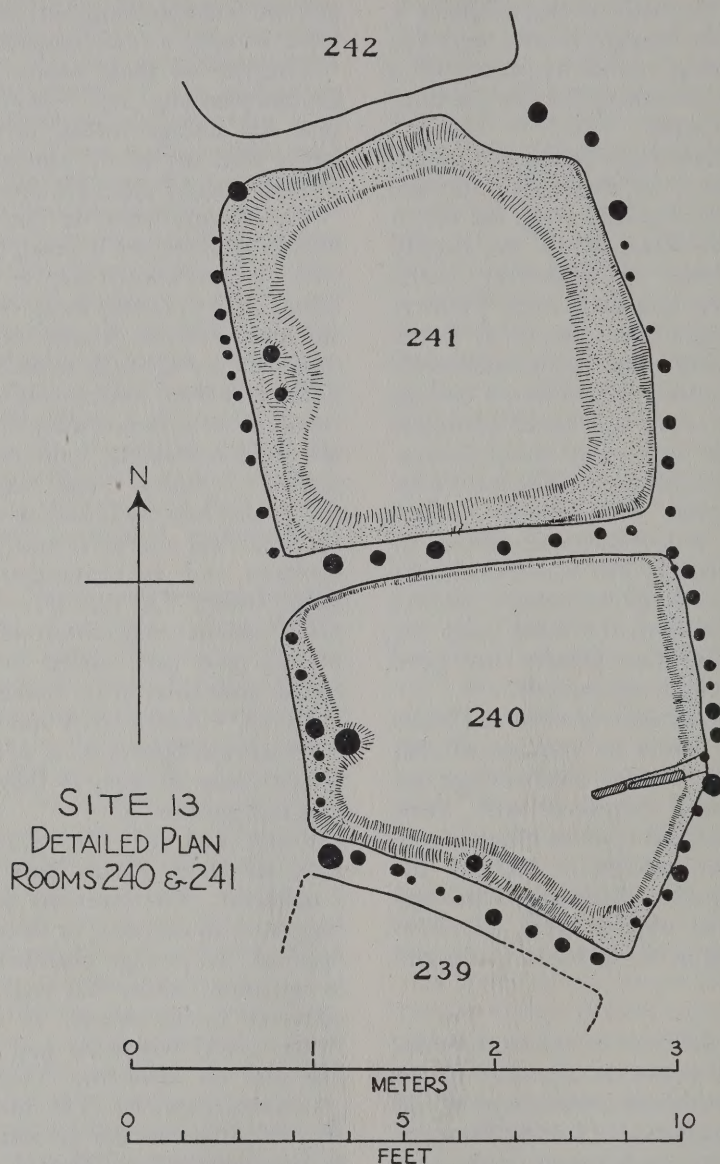


FIG. 43. Ground plan of Rooms 240 and 241, Site 13, Alkali Ridge.

ing 2 worn-out metates. Rooms 1A, 2A, 6A, and 12A had Type V adobe walls (see p. 191). The north and south walls of Room 113E and the wall between 14A and 15A were Type I. Both east and west walls of 16A were Type IV.

⁷¹ Morris, 1939; Martin and Rinaldo, 1939.

Three fragments of roof timbers from Room 100A were assigned an estimated cutting date by Stallings of 770 A.D. $\pm$ 10. Eight specimens from Room 11A, examined by the late J. H. Denison for Gila Pueblo Museum had outside

dated rings ranging from 765 to 777. Three, dated 771, 772, and 777, had remains of bark adhering.⁷²

Old Pits. Lying in part underneath Room 201 were the remains of old pits with definite floor levels but very indefinite walls. Two Basket Maker III black-on-white (Lino) potsherds were found in them, and the stratigraphy established the fact that 2 of them were at least older than Room 201. It is possible that they were isolated storage pits of the type found in association with standard Basket Maker III pit houses at Shabik'eshchee⁷³ and elsewhere. They may even have had slab walls originally, which were removed to be used in the construction of the later contiguous storage chambers. This would be an entirely unwarranted assumption on the basis of the meager evidence in the pits themselves, if it were not for the presence on the site of the 3 Type I pit houses of which two, Pit Houses I and K, also lie under the contiguous rooms. There is a possibility, mentioned on page 167, that Pit House C is a remodeled Type I pit house. If this should be true, then the pits under Room 201 may well have been associated with its earlier phase.

Rooms 240 to 243, located slightly north of the old pits, are interesting in the same connection. They seem to be Basket Maker III storerooms remodeled to become part of the later structure (figs. 27, 43). Similar finds by Roberts at Allantown (Whitewater) and by the Peabody Museum in Jeddito Valley are discussed on page 218. They represent a very important step in the development of Pueblo house architecture.

The relationships of the various houses and storerooms at the site with each other and with the pit houses will be discussed further in the sections on the development of the kiva and on the development of house architecture.

Miscellaneous Structures. Two small isolated slab-lined pits were found, one south of Room 212 and one between Room 100A and Pit House B. The former, a firepit, seems to have been built during later times and was probably associated with Unit 1. This also seems to be the best explanation for intrusive slab-lined firepits in Rooms 199 and 226 as well as for the oval pit 102 centimeters long and 72

centimeters wide let down through the north wall of 199. The slab-lined pit south of Room 100A was part of the Pueblo I occupation. It was a small bin with a semicircle cut in one slab similar to that in Hole Q, Pit House B.

Room 226, of which two walls could be traced, seems to be an isolated example of the standard storeroom. Three posts were found which correspond exactly to the typical corner roof-support posts, and the lower part of the east wall, the only one partially standing, was of upright slabs, Type I.

The peculiar outline on figure 27 between Pit House M and Room 213 is a depression approximately 60 centimeters deep. Originally its depth was 26 to 30 centimeters below the floor levels of Rooms 214A-218A. The bottom of the excavation was uneven and nothing was found to indicate use. It may have been a borrow pit.

East of, and overlapping Room 242A are remnants of a later structure. The walls were built upon fill in Room 242A but from their type, upright slabs and adobe (Type I, p. 191), it is probable that they were built during Pueblo I times.

Two wall fragments in Room 99A were similarly built on fill. The northernmost one was of Type I, the other of Type III. No associated floor was identified and no evidence was found indicating the function of these walls or of those east of Room 242.

UNIT 1

MAPS AND PLANS. Figs. 27, 44.

PHOTOGRAPHS. Figs. 82, *a*; 92, *d*; 94, *a*, *b*.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Whole and restored pieces: figs. 111, *d*, *i*; 152, *p*.

Potsherds: figs. 101, *b*; 120, *g*; 127, *l*; 131, *q*; 136, *f*; 137, *j*; 141, *a*, *b*; 151, *d*; 155; 166, *b*; 168, *b*; 169, *c*, *e*, *g*, *i*.

Drawings of pottery designs: figs. 74, *e*; 75, *i*, *m*; 77, *r*; 78, *l*, *r*; 79, *f*, *m*; 80, *g*, *i*, *k*, *m*, *n*, *q*, *r*.

Objects of stone: figs. 47, *j*, *n*; 48, *i*, *n*; 50, *c*; 51, *l*.

Objects of bone: fig. 180, *b*.

ILLUSTRATIONS OF BURIALS AND SKELETAL MATERIAL

Fig. 192, *g*, *m*.

At the northern end of Site 13 was a group of later structures consisting of both Pueblo II

⁷² See tree-ring charts, p. 90.

⁷³ Roberts, 1929.

209, 208, 207, and 206 (figs. 27; 94, *a, b*). The floors of the unit rooms were 40 to 70 centimeters above those of the rooms beneath, and some of the wall slabs of the lower rooms were still standing. The kiva was sunk in the original north plaza and, as in the deeper pit houses, the floor was 2 to 3 feet below the top of the ledge rock. Although the kiva intersected none of the pit houses, broken-up bedrock removed during its excavation had been dumped into the nearby depression of abandoned Pit House M of the earlier occupation.

House. The Unit 1 house consisted of a row of 3 coursed-masonry rooms. The southern parts of the rooms had been built upon fill in earlier storage rooms. Many of the upright slabs which formed the bases of the earlier walls were still standing when excavated (fig. 94, *a, b*). Others had been pulled up and placed flat under the later coursed-masonry walls to serve as a foundation in the loose fill.

Very few floor features were found in this house. A large corrugated jar was found on the floor in the southeast corner of Room U₁. In Room U₂ another large corrugated jar had been set in the floor, probably for the storage of water or meal. Three child burials (described below) were found in this room, 1 in the fill above the floor and 2 beneath the floor in the fill of underlying Abajo Room 207.

Room U₃ had a bin in the northwest corner. The walls of the bin were of upright slabs and the floor was flagged. Part of the north wall of Room U₃ was missing. It was, however, impossible to determine whether or not a doorway had been present there.

Kiva. The kiva of Unit 1 was of standard Mesa Verde type (fig. 44). The southern recess was but very slightly deeper than the other recesses. All save one of the pilasters were set from 6 to 20 centimeters back from the edge of the bench. The walls were for the most part of natural undisturbed material presumably covered with plaster during the use of the building. This building was cut deeply into bedrock, 70 to 80 centimeters, as shown in the cross section in figure 44. The bench was 1 meter high so that approximately four-fifths of the lower wall was of bedrock and the hard material at the top of the bedrock known locally as "white gyp." In the northeast section of the lower wall, however, there was a segment of coursed masonry, I, 140 centimeters long and extending from the floor to the top of the bench. In all other cases such a patch denoted a discontinued cist or some other previous excavation, but this one served merely to mark a deficiency in original excavation or a slight subsequent cave-in. The bedrock lay immediately behind the stones, and the sole function of the wall seems to have been to preserve the regularity of the circle.

Three niches, L, were found in the wall beneath the bench, all in the northern half of the kiva. These were from 12 to 16 centimeters in diameter and 20 to 34 centimeters deep. The one in the north bench was lined with small sandstone slabs. The other two were merely excavations in the "white gyp." No especial contents were found.

The kiva was oriented but slightly east of north. The floor was of bedrock covered by adobe mud, 6 to 8 centimeters thick. The plaster curved upward at the circumference of the floor to blend into the wall. No sipapu was found.

The firepit, A, was unusual. Although 12 centimeters deep, it was not dug out of the bedrock. Its depth was achieved by 2 processes: (a) by leaving off the floor plaster at that point and (b) by building up an adobe collar. South of the firepit was a slot, B, 8 centimeters deep, which presumably at one time held a deflector slab.

The ventilator unit was built in. The opening of the horizontal shaft, F, was faced with stones, J. The horizontal shaft was roofed with wood. Poles 4 to 6 centimeters in diameter were laid upon cross poles of approximately the same size. A vertical wall, K, was erected to serve as the rear wall of the southern recess. The vertical shaft, E, was cylindrical and lined with stones in the upper portion.

The kiva was filled with refuse material including much Pueblo III pottery. One very interesting object was found *in situ*. A stone (fig. 51, *l*), of the type classified as Corn Goddess Symbol or Tiponi, was found on the bench. It is described on page 241.

Refuse Mound. No refuse mound was found. Refuse material was fairly thick on the surface to the southeast of Unit 1, but there was no indication of an actual mound. The depression of the then abandoned Pit House M was apparently used as a refuse dump.

The pottery found in this unit was extremely interesting. The black-on-white sherds were mixed Pueblo II (Mancos Black-on-white) and Pueblo III (Mesa Verde and McElmo Black-on-white) types with the latter predominating. The exact percentages can not be given because the gradations were so fine that no satisfactory point of typological demarcation could be found. In such a case, however, that point was unnecessary, since the historical implication was clear. We had here a site which was occupied at the time when the change was taking place from Mancos to Mesa Verde fashions in pottery decoration.

Burials in Room U₂

BURIAL 1. Child.

Photograph: fig. 192, *g*.

Condition: fragile and fragmentary.

Orientation: head to north.

Position: fig. 46, *t*; in fill of underlying Room 207

beneath floor in northwest corner of Room U₂; flexed to left; torso on left side; face to left; right arm bent at elbow to bring hand over pelvic region; left arm extended at left side.
Cranial deformation: occipital flattening.
Associated finds: none.

BURIAL 2. Child, milk dentition.

Condition: fragile and fragmentary.

Orientation: head to north.

Position: fig. 46, *u*; in fill of underlying Room 207 beneath floor along west wall of Room U₂, at same level as Burial 1; flexed to right; torso on right side; face to right; left leg tightly flexed against body; right leg flexed at right angle to body; left arm extended at approximately 45-degree angle across chest to bring hand to right of pelvis above the left knee; right arm not observable.

Cranial deformation: not satisfactorily observable, either slight lambdoidal flattening or undeformed.

Peabody Museum catalogue no. N/938.

Associated finds: none.

BURIAL 3. Child. Age: 12-14.

Photograph: fig. 192, *m*.

Condition: fragile and fragmentary.

Orientation: head to west.

Position: fig. 46, *v*; in fill above floor along south wall; torso prone, face down; lower left leg bent back and parallel to femur so that foot lay to left of pelvis; right leg probably in same position; left arm flexed upward against wall at slightly greater than right angle with hand under left foot; upper right arm along right side with forearm flexed across back at right angle to bring hand to left of lumbar region.

Cranial deformation: lambdoidal flattening.

Peabody Museum catalogue no. N/935.

Associated finds: none.

Taxonomic Position of Unit 1, Site 13

PECOS CLASSIFICATION. Pueblo II and Pueblo III periods.

GILA PUEBLO SYSTEM. Mancos Mesa and McElmo Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Mancos and undefined Pueblo III Mesa Verde Foci.

UNIT 2

MAPS AND PLANS. Figs. 27, 45.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Drawings of pottery designs: fig. 76, *c*.

Objects of stone: figs. 49, *e*; 173, *a*.

Southeast of Room 198 and east of Pit House L a second kiva was discovered (Kiva 2, fig.

27). No house was found in association with it, but the area to the north of it was littered with occupational debris and it was assumed that a house had been there and that probably the wall stones had been completely removed to serve in the construction of Unit 1 or Unit 3. The pottery found in the fill of Kiva 2, mostly Pueblo II in type, indicated that this structure was earlier in date than either Unit 1 or Unit 3. One fragmentary burial was found in the fill. Pilasters were of the earlier rectangular type. Although the ground plan (fig. 45) indicates 6 pilasters, there may have been 8, as in the kiva at Site 11.

Excavation. Excavation consisted of a wide trench (fig. 45) across the kiva which revealed the main features in the north-south axis. Oriented slightly west of north, the kiva was of standard Mesa Verde type with a large southern recess. The bench was very high, ranging from 109 to 114 centimeters above floor level. Walls were of native undisturbed earth and rock which was probably originally plastered. The floor, 170 centimeters below present ground surface, was of bedrock covered with adobe plaster. The firepit was circular and 16 centimeters deep. It was surrounded by a collar of different nature from others found by the expedition. The collar had been cut out of the bedrock during the original excavation. It had been necessary to remove from 40 to 50 centimeters of bedrock and overlying "white gyp" in order to give the floor the desired depth. During the process of removing this rock, the collar of the firepit had been left in the original material. It was a ridge 15 centimeters wide and rose 3.4 centimeters above surrounding floor level.

South of the firepit was a slab deflector, B, 36 centimeters high. South of that were 2 holes, C, 10 centimeters in diameter and 8 centimeters deep, of the type in which it is assumed a 2-poled, rung ladder was set.

The level of the horizontal ventilator shaft was considerably above that of the kiva floor. At a point 40 centimeters within the shaft it was 33 centimeters higher than the floor. The horizontal shaft had a wooden roof of split poles placed on the bank of undisturbed red earth which formed the side walls of the shaft. There seemed to have been no longitudinal poles. The sticks were small, 2 to 4 centimeters in width, and set very close together, approximately 8 centimeters from center to center. At the back of the southern recess there had been a stone wall which was mostly fallen in when discovered.

Except for a few Mesa Verde sherds, almost entirely in the top fill, the pottery found was classified as Pueblo II.

Burial in Kiva 2. A fragmentary burial consisting of part of a skull and part of 1 femur only was found in the kiva fill, approximately 50 centimeters beneath the ground surface and 120 centimeters above the floor: sex, female; age, about 30. The burial had been violently disturbed at some time and no information could be obtained as to orientation, position,

or cranial deformation. No associated artifacts were found.

Taxonomic Position of Unit 2, Site 13

PECOS CLASSIFICATION. Pueblo II period.

GILA PUEBLO SYSTEM. Mancos Mesa Phase.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Mancos Focus.

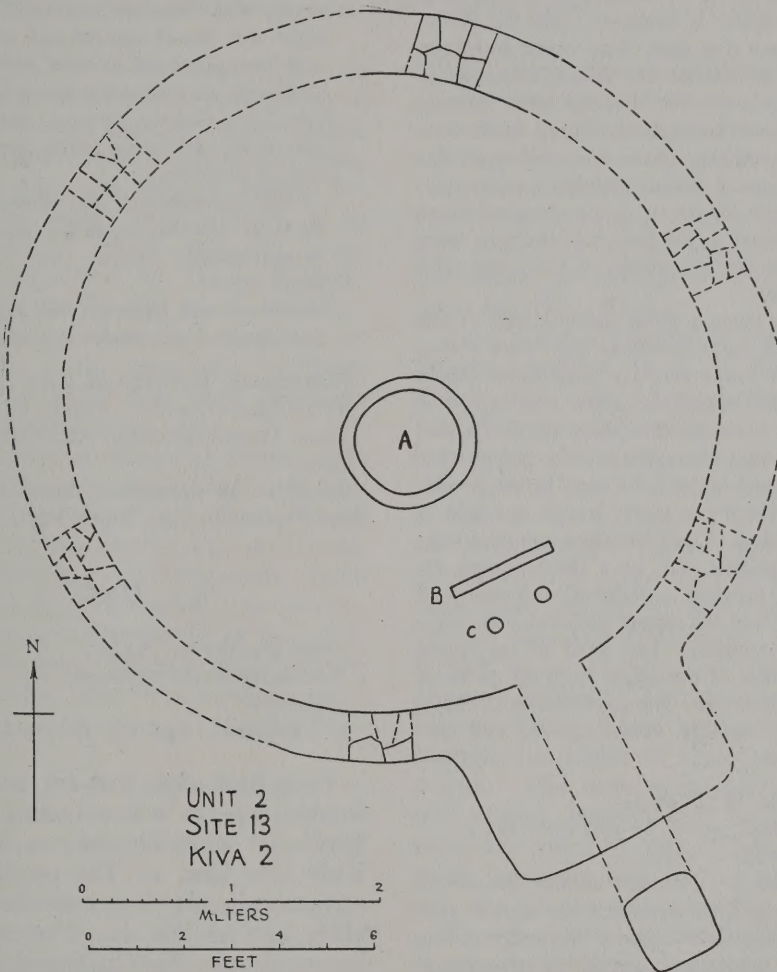


FIG. 45. Ground plan of the kiva, Site 13, Unit 2, Alkali Ridge.

UNIT 3

MAPS AND PLANS. Fig. 27.

PHOTOGRAPH. Fig. 82, a.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Drawings of pottery designs: figs. 74, a; 75, q, r; 77, k, q.

Objects of stone: fig. 50, e.

ILLUSTRATIONS OF BURIALS AND SKELETAL MATERIAL.
figs. 190, b, b'; 191, i-i''; 192, i.

Northeast of Unit 1 was a much larger unit called Unit 3. The house mound suggested at least a double row of rooms and from the height of the mound and the number of stones on the surface it is possible to infer that it might have had 2 stories. The only excavation attempted here was a test in the kiva depression. Two skeletons, unaccompanied by mortuary offerings, were encountered in this test.

The pottery found was definitely the latest

encountered at the site. The decorated ware was almost all Mesa Verde Black-on-white with many pieces which could be classified as Classic Mesa Verde.

Burial in Kiva Fill. The burial in the kiva fill, Unit 3, was a double burial of 2 adult males, with 1 skeleton above and lying in contact with the other (fig. 192, *i*). The upper is Skeleton 1 and the lower, Skeleton 2. The fact that part of an arrow-head was found broken off in one of the dorsal vertebrae of Skeleton 1 (fig. 191, *i-i''*) and that the bone fracture caused thereby shows no sign of healing indicates a violent death. In addition there was evidence of a strong blow on the head and of scalping (see p. 328). Although no definite evidence of the cause of death was found in Skeleton 2, the fact that the two were buried together permits the inference that they both met death in combat.

The photograph gives a good general idea of the relative positions of the 2 bodies as they were placed in the grave. The lower one lay with limbs flexed upward and outward while the upper was placed in extended position between the limbs of the lower. The skulls were at opposite ends, and the pelvises were touching but reversed. It will be seen in the photograph that the pelvis of the upper lay on one side of the pelvis of the lower. The impression gained during excavation was that this may be a displacement resulting from earth pressure correlated with decay of the soft parts and that the upper skeleton was originally completely extended. The head of the lower was between the shins of the upper with the point of the jaw between the knees. The upper torso of Skeleton 1 lay between the legs, flexed upward and outward, of Skeleton 2.

SKELETON 1. Male. Age: 40-44.

Photographs: figs. 190, *b*, *b'*; 191, *i-ii''*; 192, *i*.

Orientation: head to west.

Position: fig. 46, *w*; extended almost completely (see above) with feet crossed; torso supine; face up; right forearm bent slightly inward to bring hand between thighs; left arm flexed upward and slightly outward so that elbow rests on elevated knee of Skeleton 2, but with forearm brought in again so that hand lay under left side of pelvis; right knee flexed slightly upward; see discussion above for position in relation to Skeleton 2.

Cranial deformation: occipital flattening.

Peabody Museum catalogue no. N/933.

Measurements, indices, and observations: See pages 317-21.

Pathology and anomaly: See page 328.

Associated finds: Skeleton 2; fragment of chipped

stone arrow-point in dorsal vertebra; no other artifacts.

SKELETON 2. Adult male.

Photograph: fig. 192, *i*.

Condition: skull crushed.

Orientation: head to east.

Position: fig. 46, *x*; legs flexed upward and outward, with feet crossed; torso supine; face up; right arm flexed upward and outward with forearm brought back so that hand lay to right of skull; left arm extended along left side with forearm bent slightly upward and hand to left of pelvis; see discussion above for position in relation to Skeleton 1.

Cranial deformation: not observable.

Peabody Museum catalogue no. N/934.

Measurements, indices, and observations: See pages 319-21.

Pathology and anomaly: See page 328.

Associated finds: Skeleton 1; no artifacts.

Taxonomic Position of Unit 3, Site 13

PECOS CLASSIFICATION. Pueblo III period.

GILA PUEBLO SYSTEM. McElmo and Montezuma Phases.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Undefined Pueblo III Mesa Verde Foci.

UNIT 4

MAPS AND PLANS. Fig. 27.

ILLUSTRATIONS OF ARTIFACTS

Pottery

Potsherds: figs. 119, *f*; 127, *d*; 151, *p*.

West of Rooms 216-222 and northwest of Rooms 250-252 was a fourth unit. It was a Pueblo II establishment, earlier than either Unit 1 or Unit 2. The potsherds and other surface indications were similar to those of the older part of Site 12. The small stones and burned lumps of adobe found to be characteristic of Pueblo II jacal structures in the excavations at Sites 9, 11, and 12 existed here in abundance. From the size of the area covered it seemed possible that the jacals here had been even more extensive than at Site 12.

Taxonomic Position of Unit 4, Site 13

PECOS CLASSIFICATION. Pueblo II period.

GILA PUEBLO SYSTEM. Mancos Mesa Phase.

MUSEUM OF NORTHERN ARIZONA SYSTEM. Mancos Focus.

THE DEVELOPMENT OF THE PUEBLO KIVA

We might almost say that the Manor House served all the purposes of the modern town hall, police station, workshop, and village club. Sometimes it may have been used as a place of worship; at any rate, the plan of the Parish Church bears a curious resemblance to that of the early Manor House, the Nave answering to the great hall, and the Chancel — the private freehold of the Rector — to the Camera reserved for the personal use of the Lord of the Manor and his family.

— HENRY PARR MASKELL

AN OUTSTANDING characteristic of Pueblo architecture of the present day is the ceremonial room, usually subterranean, which is quite different in construction from the ordinary living and storage rooms for family use. The name "kiva," which is an Anglicization of the Hopi name for such buildings, was suggested by Major Powell¹ as a substitute for the Spanish word, "Estufa." The latter, meaning "stove," is presumed to have been applied to the ceremonial buildings under the general belief that their functions included that of the "sweat house."

It has long been an accepted theory that kivas represent in part an architectural survival of a building which in early days had served not only as the church but also as the home. Archaeological investigations have tended more and more to confirm this theory, and one of the outstanding results of the excavations by the Peabody Museum Southeastern Utah Expedition has been to add considerable further evidence of the nature of this development.

The findings on Alkali Ridge, considered in conjunction with the work of others, notably Morris, Roberts, and Martin in the San Juan drainage, permit us now to present a more complete story than has ever before been possible of the steps by which the earth lodge of the early agriculturalists on the Colorado Plateau has been transformed into the sacred temple of their modern descendants.

The part of that development which lies within the scope of this report extended from the middle of the first millennium A.D. to the end of the thirteenth century in the San Juan. During that time the semisubterranean domicile characteristic of the cultural period classified as Basket Maker III was transformed, de-

tail by detail, into the standard kiva of Pueblo III now to be seen in restorations in the extensive ruins of Mesa Verde National Park and in the large Pueblo at Aztec, New Mexico. The transformation followed a continuous though somewhat irregular course of development, and it will be the business of this section of the report to attempt to trace that development on Alkali Ridge.

As a point of departure we take the semi-subterranean pit house of Basket Maker III. Those who wish to go farther into the past than this must, at present, be content with conjecture, at the same time keeping an eye on the current work of Morris in Basket Maker II sites in the vicinity of Durango.² Roberts has published an excellent statement in which he surveys the probability of cultural connections between the Basket Maker pit houses and an assumed continental spread of earth lodges as an architectural trait from northeastern Siberia.³ Certain structural resemblances with modern house forms in Siberia⁴ support the claim of this theory for consideration. We have now reached the stage in our studies wherein it is no longer taboo to entertain ideas of the diffusion of Neolithic traits from the Old World to the New, and this one presents encouraging possibilities.

The pit house of Basket Maker III, however, is as far back as we can go in the realm of demonstrable fact. On Alkali Ridge it was represented by Pit Houses H, I, and K at Site 13. This is the Type I pit house described on pages 158-59. It will not be necessary to repeat that description here but merely to recall to the reader's mind that these were shallow pit houses, semisubterranean, with walls below ground of upright slabs and native earth coated with adobe plaster and walls above

¹ Mindeleff, 1891.

² Morris, 1941.

³ Roberts, 1929, pp. 85-86.

⁴ Jochelson, 1907, 1908.

TABLE 5. Table of kiva and pit house

SITE	BUILDING	SHAPE		ORIENTA-TION		WALLS							Bench	PILASTERS				ROOF-SUPPORT POSTS		Other Post Holes	PARTITION		
		Roughly Rectangular	Approx. Round	Approx. North-South	Other	Native Earth Plastered	Slab	Upright Posts	Post and Adobe	Plain Adobe	Coursed Masonry	Masonry Retaining Walls Only		Number	Rectangular	Expanding	Indented	Main Room	South. Ante.		Continuous	Discontinuous	
1	Unit 1, Kiva	o	x	x	o	o	x	o	o	o	x	o	x	6	o	x	o	o	o	o	o	o	o
1	Unit 2, Kiva	o	x	x	o	x	o	o	o	o	x	o	x	6	o	x	o	o	o	x	o	o	o
2	Kiva	o	x	x	o	x	o	o	o	o	x	o	x	6	o	x	o	o	o	o	o	o	o
3	Kiva	o	x	x	o	x	o	o	o	o	o	o	x	4?	x	x	x	o	o	o	o	o	o
5	Kiva 1	o	x	x	o	x	o	o	o	o	x	o	x	6	o	x	o	o	o	o	o	o	o
5	Kiva 2	o	x	x	o	x	o	o	o	o	o	x	x	6	o	x	o	o	o	o	o	o	o
6	Kiva	o	x	x	o	x	o	o	o	o	o	o	x	6	o	x	o	o	o	o	o	o	o
7	Kiva	o	x	x	o	x	o	o	o	o	o	x	x	6	x	o	x	o	o	o	o	o	o
7	Pit House	o	x	x	o	x	?	o	o	o	o	o	o	o	o	o	o	?	?	?	?	?	?
9	Kiva	o	x	x	o	x	o	o	o	o	o	o	o	o	o	o	o	4	o	o	o	o	o
11	Kiva	o	x	x	o	x	o	o	o	o	o	x	x	8	x	x	o	o	o	o	o	o	o
12	Kiva 1	o	x	x	o	x	o	o	o	o	o	o	x	8	x	o	o	o	o	o	o	o	o
12	Kiva 2	o	x	x	o	x	o	o	o	o	o	o	x	6?	x	o	o	o	o	o	o	o	o
13	Pit House A	x	o	x	o	x	x	o	o	x	o	o	o	o	o	o	o	4	o	x	o	x	x
13	Pit House B	o	x	x	o	x	o	x	x	o	o	o	o	o	o	o	o	6	4	x	x	o	o
13	Pit House C	o	x	x	o	x	o	o	?	x	o	o	o	o	o	o	o	6	o	x	o	x	x
13	Pit House D	o	x	x	o	x	x	o	x	o	o	o	o	o	o	o	o	6	o	x	o	x	x
13	Pit House E	o	x	x	o	x	o	x	x	o	o	o	o	o	o	o	o	6	o	x	x	o	o
13	Pit House F	x	o	x	o	x	o	o	x	o	o	o	o	o	o	o	o	4	o	x	o	x	x
13	Pit House G	o	x	x	o	x	x	o	o	x	o	o	o	o	o	o	o	4	o	x	o	x	x
13	Pit House H	x	o	x	o	x	x	x	o	o	o	o	x	o	o	o	o	4	4	x	o	x	x
13	Pit House I	x	o	x	o	x	x	o	o	o	o	o	?	o	o	o	o	4	?	x	o	x	x
13	Pit House J	o	x	x	o	x	o	o	?	o	o	o	o	o	o	o	o	4	o	x	o	?	?
13	Pit House K	x	o	x	o	x	x	o	o	o	o	o	o	o	o	o	o	4	4	x	o	x	x
13	Pit House L	x	o	x	o	x	o	o	o	x	o	o	o	o	o	o	o	4	o	x	o	x	x
13	Pit House M	o	x	x	o	x	o	x	x	o	o	o	o	o	o	o	o	6	?	x	o	?	?
13	Pit House N	o	x	x	o	x	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
13	Unit 1, Kiva	o	x	x	o	x	o	o	o	o	o	o	x	6	o	x	x	o	o	o	o	o	o
13	Unit 2, Kiva	o	x	x	o	x	o	o	o	o	x	o	x	?	x	o	o	o	o	o	o	o	o
	Pit House Totals	6	9	15	o	15	6	4	5	4	o	o	1		o	o	o			13	2	9	
	Kiva Totals	o	14	14	o	13	1	o	o	o	5	3	12		5	8	2			1	o	o	
	Grand Totals	6	23	29	o	28	7	4	5	4	5	3	13		5	8	2			14	2	9	

x denotes presence.

o denotes absence.

? denotes not observable.

characteristics, Alkali Ridge sites.

Adobe Floor Ridges	Enlarged Southern Recess	Passageway	S. ANTE- CHAM- BER		VENTI- LATOR		FIRE PIT		DEFLECTOR			Sipapu	Jar Neck in Sipapu	Ladder Holes?	Pot Holes, Other Pits, etc.	Bins	Wall Niches	Wall Cists	Amount Excavated	BUILDING	SITE
			Large	Small	Tunnel	Built-in	Adobe Collar	Slab-lined	Slab	Post and Adobe	Coursed Masonry										
0	0	0	0	0	0	x	0	0	x	0	0	x	x	0	0	0	0	0	All	Unit 1, Kiva	1
0	x	0	0	0	?	?	0	0	x	0	0	0	0	0	0	0	x	0	Trench	Unit 2, Kiva	1
0	?	0	0	0	0	x	x	0	0	0	x	0	0	0	0	0	x	0	1/2+	Kiva	2
0	0	0	0	0	0	x	x	0	0	0	0	x	0	0	0	0	0	0	1/2+	Kiva	3
0	0	0	0	0	0	x	x	0	0	?	0	0	0	x	0	0	0	0	1/2+	Kiva 1	5
0	0	0	0	0	0	x	0	0	?	?	0	0	0	x	0	0	0	0	1/2+	Kiva 2	5
0	0	0	0	0	0	x	0	x	?	0	0	0	0	0	0	0	0	0	1/2+	Kiva	6
0	0	0	0	0	x	0	x	0	?	0	0	x	0	0	x	0	0	0	All	Kiva	7
?	0	x	?	?	0	0	?	?	?	?	?	?	?	?	?	?	0	0	Trench†	Pit House	7
0	0	0	0	0	x	0	x	0	?	0	0	x	0	0	0	0	0	0	All	Kiva	9
0	x	0	0	0	x	0	0	x	0	0	0	x	0	0	x	0	x	x	All	Kiva	11
0	0	0	0	0	x	0	x	0	0	0	0	0	0	0	0	0	x	0	1/2+	Kiva 1	12
0	0	0	0	?	x	0	x	0	0	0	0	x	0	?	0	0	x	x	1/2+	Kiva 2	12
0	0	x	0	x	0	0	x	0	0	0	0	x	0	0	x	0	x	0	All	Pit House A	13
x	0	x	0	x	0	0	x	0	0	0*	0	x	0	0	x	0	x	0	4/5	Pit House B	13
x	0	0	0	x	0	0	x	0	0	0	0	?	0	0	x	0	x	0	All	Pit House C	13
x	0	x	0	x	0	0	x	0	x	?	0	x	0	0	x	x	0	x	All	Pit House D	13
x	0	x	0	x	0	0	x	0	0	0*	0	?	0	0	x	0	0	0	All	Pit House E	13
x	0	x	0	x	0	0	0	0	0	x	0	x	0	0	x	0	x	0	All	Pit House F	13
x	0	x	0	x	0	0	0	0	x	0	0	?	0	0	x	0	x	0	All	Pit House G	13
x	0	0	x	0	0	0	0	0	0	0	0	x	0	0	x	0	0	x	All	Pit House H	13
0	0	0	x	0	0	0	0	0	x	0	0	?	0	0	x	0	0	0	All	Pit House I	13
0	0	0	0	0	x	0	0	0	?	0	0	0	0	0	x	0	0	0	All	Pit House J	13
x	0	0	0	x	0	0	0	0	0	0	0	0	0	0	x	0	0	0	All	Pit House K	13
x	0	0	0	0	x	0	x	0	x	0	0	0	0	0	x	0	0	0	All	Pit House L	13
x	0	?	?	?	?	?	x	0	?	?	?	?	?	?	0	x	x	?	1/3	Pit House M	13
0	0	0	0	0	0	0	0	0	0	0	0	?	0	0	x	0	0	0	All	Pit House N	13
0	0	0	0	0	0	x	x	0	?	0	0	0	0	0	0	0	x	0	All	Unit 1, Kiva	13
0	x	0	0	0	x	0	x†	0	x	0	0	0	0	x	0	0	0	0	Trench	Unit 2, Kiva	13
10	0	7	2	8	2	0	7	0	4	1	0	5	0	0	14	2	5	2		Pit House Totals	
0	3	0	0	0	6	7	9†	2	3	0	1	6	1	3	2	0	6	2		Kiva Totals	
10	3	7	2	8	8	7	16	2	7	1	1	11	1	0	16	2	11	4		Grand Totals	

* Continuous partition wall provides deflector.

† Collar carved from original bedrock in Site 13, Unit 2, kiva.

‡ Building largely destroyed by later kiva.

ground of wooden poles. The roof of the large room, as far as our evidence goes, was flat, supported mainly by 4 upright posts set in the floor and secondarily by the posts of the walls. Roberts has published a conjectural reconstruction of a Basket Maker III pit house in Chaco Canyon which shows probable roof and wall construction.⁵ The southern antechamber was large, sometimes more than half the size of the main room (fig. 97, *a*). Unlike the very small southern antechambers of later Pueblo I pit houses, the Basket Maker III antechamber was sufficiently spacious to serve as sleeping quarters or as a general sitting room. Good examples of such rooms on Mesa Verde are shown in Lancaster and Watson (1943). The entrance is presumed to have been through this antechamber with possibly a second entrance, or at least a smoke hole, in the roof of the main chamber. The roof entrance is usually thought to have been in the center or slightly south of the center in the north-south axis. Recent new evidence from the Durango district in southwestern Colorado suggests that in some buildings this entrance may have been at one corner of the flat part of the roof.⁶ Frank C. Lee has published a conjectural drawing of a roof with a hatchway in this position as the result of findings at Site Ignacio 12:1.

The use of the antechamber for an entrance can not be considered as absolutely established, but there is good probability that the theory is correct. Roberts found a gap in the slab wall at the western side of the antechamber in House A at Shabik'eshchee.⁷ At Site 13 on Alkali Ridge we found a large slab, of the sort often used as a door plug, leaning against the wall at the same side of the antechamber in Pit House B. The difficulty in obtaining evidence of this phenomenon lies apparently in the fact that if the doorway was present it was usually at or above ground level and no remains of antechamber wall super-structure have yet been found. The floors of the antechambers are usually, themselves, close to the surface, even in the deep Type II and III pit houses, so that entrance by this means would

be easy and would necessitate neither steps nor ladder which might leave remains or marks for the archaeologist.⁸

The presence of a deflector in the main room of the pit houses is a point in favor of the theory. Situated between the firepit and the opening of the passageway to the antechamber, it indicates that a draught must have entered the room from that passageway. It can be argued that there might have been merely a ventilator hole in the antechamber, but I favor the entrance theory as a more likely explanation.⁹

Associated with the earliest known pit houses were oval and circular slab-lined rooms or cists which from their small size, the absence of firepits, and the nature of their contents have been assumed to be granaries. These were scattered about the village, singly or in groups (see Roberts' map of Shabik'eshchee).¹⁰

Insofar as it is possible to reconstruct the villages of these times and life within them, the deduction of most importance to our present discussion is that the pit house seemed to provide all of the domiciliary needs of the villagers. And, furthermore, it has been generally assumed that ceremonial observances took place in them as well. Strong support for this belief is supplied by the hole in the north-south axis of the floor which corresponds in location with the sipapu of modern kivas and corresponds in general size and appearance with the hole called sipapu in many Pueblo III kivas. If this supposition is correct, we then may conclude that the domiciliary and part, at least, of the religious functions of life during Basket Maker III times were performed within the pit houses.

It is necessary to point out that evidence for the occurrence of specialized religious architecture even at this early date seems to be accumulating, such as the large structure which Roberts calls a kiva at Shabik'eshchee¹¹ which resembles the 2 "Great Kivas" found by Martin at his later Site 1 in the Ackmen-Lowry region.¹²

The features discussed above will be found listed in table 5, along with the variations and

⁵ Roberts, 1929, fig. 2.

⁶ Lee, 1940; Flora, 1940a. ⁷ Roberts, 1929, fig. 1.

⁸ For a discussion of entrance ladders, see pp. 155-56.

⁹ Ventilators are discussed on pp. 209-10.

¹⁰ Roberts, 1929, pl. 1.

¹¹ Roberts, 1929, pp. 73-81.

¹² Martin and Rinaldo, 1939, pp. 350-59.

additions found in later structures. The first observed modification in the simple but somewhat restricted village organization occurred, apparently, during the last part of the seventh and the early part of the eighth century. In sites of that age we begin to find that the slab-lined storage bins have been consolidated into rows of contiguous small rooms such as those found at Site 13 on Alkali Ridge. But of greater importance to the history of the kiva is the fact that associated with and attached to the new kind of storage chambers was a new kind of dwelling. This was a large room, often bigger than the pit house rooms, with the floor at ground level. Abundant evidence of domiciliary function has been found in these rooms on Alkali Ridge and elsewhere, including many tools, firepits, and even deflectors. They have been described in detail on pages 195-97 and will be discussed further, in the section following this, which treats of the developments of house architecture.

The significance of the new dwellings was that the pit houses were relieved in part of their domiciliary functions and a definite step had been taken toward specialization as a religious building. From this time onward the specialization increased and it can be traced in the architecture. Despite popular belief, that specialization has never become complete. The kivas of the modern Hopis, for instance, are not completely religious in their functions. Secular events, as we define the term in our civilization, take place within them.

Along with the first step toward liturgical specialization, we find certain very definite changes in architectural features, many of which point toward the forms encountered later in the so-called true kivas. This "looking forward" is reflected in archaeological terminology. A confusion in terms has arisen because of classificatory difficulties created by efforts to label the buildings in which these changes are to be seen as "pit houses" or "kivas" on the basis of architectural standards which either preceded or followed them. So we have "Pit Kiva," "Protokiva," "Pre-Kiva," "Domiciliary Kiva," etc.

These are the Type II and Type III pit

houses of this report (pp. 154-58). In them we note the following changes which seem to be in the direction of the eventual kiva. They are deeper in the ground than the early pit houses and they show a marked tendency to dispense with slabs in wall construction. In fact, on Alkali Ridge no slabs were found in the main walls, as at Shabik'eshchee, but only in some of the partition walls across the south end of the main room. Some of the later ones closely approximate a true circle in the outline of the main room. In these the traditional quadrilateral pattern of 4 roof-support posts has often been superseded by a hexagonal pattern in which the positions of the posts correspond with the positions of pilasters in later kivas, as in Pit House D (fig. 32). Whether or not the cribbed roof of the later kivas was introduced at this time is unknown. Conjectural reconstructions of roofs of deep pit houses have been published by Roberts¹³ and Morris.¹⁴ The latter suggests a solution of a mystery which has bothered us for years in the excavation of buildings of this kind. If the space in the wall between the top of the ground and the roof had been filled by slanting poles, it seems that post holes or, at least, some traces of marks made by the butts of these poles should be visible where the original ground surface remained intact. Sometimes these have been found, sufficiently often to confirm the conjecture of the presence of that roof type. More often, however, no trace of such poles has been found. Morris' solution is that the poles in this wall were laid horizontally, one above the other, and were supported by slanting poles at the corners only.¹⁵

Perhaps the most striking modification of all is the change in the southern antechamber. The new above-ground houses seem to have removed the necessity for this room, and it has become very small or disappeared altogether. In the cases where it is lacking, its place has been taken by a ventilator of similar construction to those in the earlier of the so-called "true kivas." That is, the ventilator consists of a horizontal tunnel excavated from the interior of the house which intersects a vertical shaft dug down from the surface (figs. 19, 39, 41).

¹³ Roberts, 1939, pls. 3, b, 4, a; figs. 23, 28.

¹⁴ Morris, 1939, fig. 13.

¹⁵ Morris, 1939, fig. 13.

The subsidiary division of the main room called the "south end," south of the partition wall, is still present. This is the section variously spoken of as "workshop," "mealing section," and "women's section" (because women are supposed to have ground the corn then, as they do in Pueblo towns today). These conceptions arise from the concentration of manos and metates in this part. Relatively large numbers of such implements were found in the south ends of Alkali pit houses. Roberts thinks that, in the deep pit houses, the south end may have had some ceremonial significance. He suggests that:¹⁶ "Persons not taking part in such religious observances as were performed in the main portion of the room may have gathered in the compartment where they could witness but would not intrude upon the rites. An analogous situation is described in a report on a council held in an earth lodge at the mouth of the Platte River in 1833. The writer (of this account), J. T. Irving, observed that the passage was completely crowded with women and children watching the progress of events within the structure."¹⁷ In an earlier report Roberts suggested that the so-called "spectators bench" in modern Hopi kivas may represent a modified survival of the south end compartment.¹⁸ This seems to be a reasonable assumption and agrees with the conclusion, reached as a result of our work on Alkali Ridge, that the southern recess of Pueblo II and Pueblo III kivas in the San Juan is probably in part a survival of the tradition of the "south end." This theory will be referred to again later in the section.

The next step is the transformation of a structure which can be called, in the terms of this report, a deep pit house into one which can be called, according to general usage, a Pueblo kiva. That step is now reasonably clear. Let it be understood, however, that by "clear" I do not mean simple. Although the process itself was simple enough, to work it out by archaeological methods has been far from simple.

At this stage in the development of the kiva, as in all others, changes do not come

about universally at one moment, nor, despite theories of concentric dispersion of culture traits, do they originate all in one place. "Progress" occurs spasmodically and erratically, and, furthermore, a new architectural trait might spread from a kiva on Mesa Verde to Zuni on the south and to the Grand Canyon on the west before being adopted by the somewhat competitive and antagonistic kiva in the next plaza, whose members will have nothing to do with "that bunch of young radicals in the Porcupine kiva." We blind ourselves witlessly when we attempt to draw our picture with classificatory tools so simple that they can not cope with natural situations of this kind.

The radicals and conservatives we have always with us. If we can make any hard and fast rules about human relationships, that surely is one of them. And the members of a given kiva, furthermore, may be radical in some respects and conservative in others. They may, for instance, have the newest thing in masonry ventilator installation while disdaining the new-fangled pilasters and sticking to the old system of 4-post roof support, even though they have to dodge and side-step around those posts every time they try to do anything in the kiva.

That very situation is to be seen in Pueblo I Pit House A, dated 868-872 A.D., by tree-rings, found by Martin at his Ackmen-Lowry Site 1.¹⁹ It has a built-in masonry ventilator shaft very similar to those found in some of the Pueblo II kivas on Alkali Ridge (figs. 11, 15), yet it has a typical Pueblo I roof-support setup. On the other hand, many of the later Alkali Ridge Pueblo II kivas which have a bench and pilaster roof-support system still maintain the old style of "intersecting shaft-and-tunnel" ventilator. And approximately contemporaneous with the occupation of Martin's Pit House A we find in Structure 3, Group 1, at Roberts' Whitewater site in eastern Arizona a building which had the new style of cribbed roof held up by 2 simple floor posts, 2 posts incased in adobe columns against the wall, and 1 masonry pilaster.²⁰ Yet this building with such advanced roof type had

¹⁶ Roberts, 1939, pp. 25-26.

¹⁷ Bushnell, 1922, p. 117; Irving, 1835, vol. 1, p. 234.

¹⁸ Roberts, 1929, p. 89.

¹⁹ Martin and Rinaldo, 1939, fig. 73.

²⁰ Roberts, 1939, pp. 46-53 and figs. 6, 7.

the tunnel-and-shaft ventilator, standard for its time.

And so it goes, simple indeed, but I am afraid it "won't classify"; at least, not in terms of pit house or kiva.

Two of the most important changes which produced the Pueblo II kiva have now been mentioned in otherwise typically Pueblo I structures. The built-in masonry ventilator in Pueblo I Pit House A at Ackmen-Lowry 1 reconstruction is correct, in Structure 3, and the cribbed roof, if Roberts' conjectural Group 1, at Whitewater, represent the earliest known appearances of these 2 features. The earliest built-in masonry ventilator found on Alkali Ridge was in the kiva at Site 3, dated by typology of pottery and architecture as early Pueblo II.

A study of ventilator construction is not only interesting in itself but it indicates clearly that our theory of kivas developing directly from pit houses is sound. Perhaps many of my readers will feel that this confirmation is unnecessary, at this time, after the theory has been granted general acceptance for years. All theories must be demonstrated, however, sooner or later, and confirmed or exposed as fallacious, as the case may be. The reason I emphasize ventilators in this connection is that so many of them were installed as "modernizations" in old southern antechambers. Thus we have remodeling in a given building, and the process of substitution of one of the most specialized characteristics of kivas for one of the most specialized characteristics of pit houses is to be seen going on, so to speak, before our very eyes. Published photographs and plans show this very clearly in Pit Houses B and C at Ackmen-Lowry Site 1.²¹ Further remodeling in the same section of later kivas is shown in Sites 11 and 12 at Alkali Ridge (see pp. 141-44 and 149-50).

Ventilation in most Basket Maker III and Pueblo I pit houses was apparently provided by a smoke hole or perhaps by an entrance in the roof acting in combination with an entrance or aperture of some kind in the south-

ern antechamber. That a draft came through the passageway from the antechamber is attested by the various deflector slabs and walls which served to keep it from blowing directly on the fire in the main fireplace.

The first device exclusively for the purpose of ventilation was very simple. Two tunnels were dug in the firm earth of the mesa-top, one running horizontally from the wall of the pit house or kiva, the other coming down vertically from the ground surface to intersect the horizontal shaft at approximately a right angle (fig. 19). It first appears in place of the passageway and southern antechamber in pit houses. Roberts found one at Shabik'eshchee which he classifies as Basket Maker III.²² It occurs somewhat more frequently in sites generally classified as Pueblo I. A good example may be seen in Morris' Protokiva 13 at Site 33 in the Mancos-La Plata country²³ and in Pit Houses J and L on Alkali Ridge.²⁴ In early Pueblo II kivas on Alkali Ridge it is the usual type found (Sites 7, 9, 11, 12, both kivas; and Unit 2, Site 13).

In late Pueblo II and Pueblo III kivas in the Mesa Verde area the built-in type of ventilator is almost universal.²⁵ Both the horizontal and vertical shafts are constructed entirely of masonry and the horizontal shaft has a roof usually made of wood but sometimes with stone slabs above wooden poles. This roof carries part of the load of the southern recess, the back wall of the southern recess, the front wall of the vertical shaft, and whatever fill may exist between the 2 last named. The built-in ventilator necessitates a larger original excavation than does the intersecting-tunnel type. It is part of the increasing emphasis on architecture shown in the prehistory of the San Juan. More and more time and labor were expended on building construction as time went on.²⁶ On Alkali Ridge built-in ventilators were found in the following sites: 1, 2, 3, 5, both kivas; 6, and Unit 1, Site 13.

Perhaps the most distinctive feature of Pueblo II subterranean structures in comparison with those of Pueblo I is the bench upon

²¹ Martin and Rinaldo, 1939, pp. 342-49.

²² Roberts, 1929, p. 20 and pl. 2, b.

²³ Morris, 1939, fig. 20.

²⁴ Figs. 39, 41.

²⁵ Kidder, 1924, pl. 28; Fewkes, 1908a, fig. 93; and figs. 12, 15.

²⁶ The ultimate achievement in costly building in the San Juan seems to have been the round towers, still to be found in Mesa Verde Park and in Hovenweep National Monument, where the stones in the walls were cut to the curve in the wall.

which are generally to be found the pilasters for the support of the roof. This bench usually completely encircles the room, although sometimes there is a gap in it at the south end where the ventilator unit occurs. The last situation is found only in the earliest structures with benches.

In common with other diagnostic characteristics of Pueblo II and Pueblo III kivas, the bench is to be observed occasionally in earlier buildings. It made its appearance, evidently, as a ledge into which the ring of posts forming the upper parts of the walls of pit houses was sometimes set. Examples of this are to be seen in House C at Shabik'eshchee²⁷ and in Pit House 16 at Jeddito Site 264.²⁸ Early benches without the ring of posts, and therefore actually providing a large amount of usable bench space, were found in Structures 12 and 15 at Whitewater.²⁹ Again, on the basis of associated pottery, these buildings antedate the Pueblo II kiva at Site 9 on Alkali Ridge which does not have a bench, or banquette as it is often called in kivas. The bench with a ring of posts set into it is one of the bones of contention between the San Juan and the Mogollon. Haury found it in many of the pit houses at Forestdale, but it has appeared at neither Mogollon village,³⁰ the Harris Site,³¹ nor the S U Site³² in the Mogollon country. It is too early, as yet, to express an opinion as to which way this trait was moving.

On Alkali Ridge pilasters to support the roof first appeared on the bench in Pueblo II kivas. Discussing the development of the pilaster, on the basis of his large amount of excavation in early sites, Roberts says:³³ "In the earliest of the semisubterranean structures the main support posts for the roof were set in the floor some distance from the walls of the chambers. As time went on, the posts were placed almost, but not quite, against the wall. A tendency for the weight of the superstructure to push one of the posts out of alinement, toward the wall, led to reinforcing it with blocks of stone and mud plaster. From the first attempts to construct such a brace a fairly good pillar was evolved and then it was dis-

covered that the pillar itself was fully capable of supporting the roof and that the wooden upright posts were not necessary." The discovery of the structural properties of stones laid in adobe mud was certainly an important event and will be discussed further in the next section of this report in connection with the development of house architecture.

Something along the lines suggested by Roberts seems, from the accumulated evidence, to have happened. The next step was the placing of the masonry column on the bench. The early pilasters on Alkali Ridge were small in comparison with the later ones. They were rectangular in horizontal cross section instead of being wider at the back than at the front and were sometimes set back a few centimeters from the edge of the bench. The pilasters in the kiva at Site 7 are good examples of the early pilasters (fig. 17). Differences in size, shape, and appearance between the early Pueblo II and the later standard pilasters can be seen by comparing the small pilasters in the kivas in figures 17; 23; 86, *c*; 89, *a* with the larger ones of standard Mesa Verde type in figures 6; 8; 16; 84; 85, *a*. Site 11 presents a splendid example of both kinds in one kiva (figs. 21; 87, *c*). A revision of that kiva, involving the blocking off of 2 large cists, apparently permitted the modernizing of the southern pair of pilasters. It will be noted on figure 21 that the southwestern pilaster, of standard type, is more than twice as wide as any of the 6 old-style pilasters. This change took place during the period we know as Pueblo II.

The outstanding characteristics of the new-style pilasters were 3: (1) their great size; (2) the superior masonry, with larger, better-trimmed blocks of stone, more carefully set in definite courses; and (3) the widening of the pilasters from front to back. The last is a significant change, architecturally, because it brings the previously rectangular pilasters into the circular plan of the kiva. The side walls of the pilasters become as the outer sections of radii of the circle. This geometric conformance is developed to an even greater ex-

²⁷ Roberts, 1929, fig. 4.

²⁸ Brew, 1941, fig. 3.

²⁹ Roberts, 1939, figs. 28, 36.

³⁰ Haury, 1936b.

³¹ Haury, 1936b.

³² Martin, Rinaldo, and Kelly, 1940.

³³ Roberts, 1939, p. 35.

tent in the peripheral circle of rooms at the Great Kiva at Aztec, New Mexico.³⁴ In addition to 2 of the 8 pilasters at Site 11, this "expanding" form is to be noted in the Pueblo II kivas at Site 5 and was universal in the sites at which Mesa Verde pottery types were found.

The roof supported by these pilasters was made of logs, built up in a crib-work and covered with brush and adobe mud. In the center was a hole which served as both entranceway and smoke hole. This conclusion is based on extensive evidence provided by the charred remains of roofs in open sites and by the remains of original structures in cave sites. Good photographs of aboriginal cribbed roof construction on the Mesa Verde and a reconstruction model have been published by Fewkes.³⁵ Conjectural reconstruction drawings showing cribbed roofs have been published by Fewkes,³⁶ Prudden,³⁷ Roberts,³⁸ Morris³⁹ and others. Most of these are for Pueblo III structures, but evidence found in Pueblo II kivas permits the assumption that they were usually roofed in this manner.

Cribbed roofs are not the only type found on prehistoric Pueblo kivas, however, particularly in the Little Colorado and Kayenta regions where rectangular and D-shaped kivas with flat roofs are common.⁴⁰ Flat-roofed kivas are known to have existed in the Mesa Verde region as well. The outstanding example is one in the Natural Bridges National Monument, west of Blanding in San Juan County, Utah, with flat roof and runged ladder⁴¹ remaining intact *in situ*. This building has been described by C. R. Steen.⁴² The roof was made of large cottonwood *vigas* on which juniper poles were laid touching each other. On top of these was a double layer of juniper shakes covered with adobe mud.

The Pueblo II kiva, after the installation of bench and pilaster, presented a quite different appearance from that of the earlier pit houses. This can be seen at a glance by comparing the photographs and plans of the Alkali Ridge

kivas in this report with those of the Site 13 pit houses.

The removal of domiciliary functions had, so to speak, cleared the floor. In most of the Pueblo II and Pueblo III kivas the only permanent features on or in the floor were the deflector and the firepit, with sometimes the addition of a sipapu, all of these usually arranged in standard order, from south to north as listed, in the north-south axis. The bewildering mass of pits, basins, and other holes, characteristic of pit house floors, had disappeared.

The sipapu was by no means a standard feature in Pueblo II and Pueblo III sites on Alkali Ridge or elsewhere. The reason for this variation is unknown. Hopi Indians working for me in the Jeddito Valley, where a similar situation prevails with regard to sipapus, have told me that they considered this to be perfectly normal, because some kivas and societies hold ceremonies involving the use of sipapus while others do not.

The use and nature of the sipapu in modern Pueblo kivas have been discussed by Mindeleff⁴³ and, more recently, by E. C. Parsons.⁴⁴ According to Mindeleff it is "the place of the gods, and the most sacred portion of the ceremonial chamber. Around this spot the fetiches are set during a festival; it typifies also the first world of the Tusayan genesis and the opening through which the people first emerged. It is frequently so spoken of at the present time." The assumption by which the hole in similar position in prehistoric kivas and pit houses is correlated with the modern sipapu seems to be logical.

The deflector was an upright slab set in the floor between the fireplace and the opening of the ventilator shaft. Post-and-adobe deflector walls were not found in Pueblo II kivas on Alkali Ridge. In Pueblo III times coursed-masonry deflectors became very common in Mesa Verde kivas. One of these was found in the kiva at Site 2 on Alkali Ridge. Although there is no means of knowing when

³⁴ Morris, 1921b.

³⁵ Fewkes, 1920a.

³⁶ Fewkes, 1909, pl. 15.

³⁷ Prudden, 1918, pl. V.

³⁸ Roberts, 1929, fig. 26.

³⁹ Morris, 1921b.

⁴⁰ Mindeleff, 1891; Kidder, 1924; Brew, 1937.

⁴¹ Runged ladders and ladders made of a notched single log have both been found *in situ* in cave sites in the Mesa Verde region.

⁴² Steen, 1937.

⁴³ Mindeleff, 1891, p. 122.

⁴⁴ Parsons, 1939.

the masonry deflector was installed in that kiva, the greatest probability is that it was during the closing years of the use of the site, in association with Mesa Verde Black-on-white pottery.⁴⁵ Although not found on Alkali Ridge, a continuous low coursed-masonry wall sometimes occurs between the firepit and the ventilator opening. Morley found one in Kiva E at Cannonball ruin⁴⁶ nearby in southwestern Colorado. It is reminiscent of the partition walls which mark off the south end of the earlier pit houses.

The firepits had become greatly standardized. Almost all had a collar and many were slab lined. No slab-lined firepits were found in pit houses on Alkali Ridge.

Adding to the difference in appearance was the fact that the Pueblo II kivas were deeper than those of previous subterranean structures. Floors were 50 to 100 centimeters deeper than those of even the Type III deep pit houses. Attaining the desired depth on Alkali Ridge almost always entailed considerable excavation into the bedrock. The extra work involved in this can not be considered strange, for it reflects a common social trait. In many civilizations, including our own, the ceremonial buildings represent special economic effort. Much more work per cubic foot was put into the cathedral at Chartres and into the Mormon Temple at Manti, Utah, than into the homes and commercial buildings of the people who erected those edifices.

The walls of kivas, for the most part, were still without stone facing. Whenever stone appeared in Pueblo II kiva walls during the excavations on Alkali Ridge, we were sure to find the remains of an old pit or cist behind them. The stones were used merely as a retaining wall to support the loose back fill. Ordinarily the plaster was applied to the native materials in which the excavation for the building had been made. The lower part of that wall was of bedrock, but the upper part was almost as sturdy. The fact that the faces of the walls were usually found intact upon excavation by the expedition, almost a millen-

nium after they were first dug, speaks sufficiently for the cohesive properties of the native red earth. The farmers and cattlemen of the region today dig storage cellars in the same manner, using the face of the excavation for wall without the addition of brick, stone, or wood.

To build in this manner necessitated a precision in planning of a different type from that employed, for instance, in the construction of a house on Long Island. Instead of merely digging a hole and building the cellar wall in it, these people had to dig the hole, with a vertical face, according to the exact size of the building they had in mind. Instances have already been cited earlier in the report where internal features were provided for during this original excavation; including the lower part of the partition wall between the main room and the southern antechamber at Pit House H, Site 13 (fig. 37); and the collar left in the bedrock around the firepit of the Unit 2 kiva at the same site. The marks of the digging sticks were often found by us in cases where the face of the wall had not been smoothed off before plastering. These marks may be seen in the photograph of Pit House F, Site 13 (fig. 96, c).

In addition to wall plaster, painting in geometric designs was found on the wall of the kiva at Site 11. This is described on page 141 and illustrated in figure 87, *b, d*. As far as I am aware the painting in this Pueblo II kiva is the earliest example yet found of painted walls in the Pueblo civilization. Painted designs on kiva walls were quite common apparently in Pueblo III. They have been found and described in the Mesa Verde area⁴⁷ and elsewhere in the Southwest.⁴⁸ The magnificent development of kiva murals in Pueblo IV in the Hopi country is now being brought to light by the Peabody Museum Awatovi Expedition,⁴⁹ and examples of modern kiva painting, for the art still goes on, were published as early as 1850 by Simpson⁵⁰ who observed and recorded them in kivas then in use at Jemez Pueblo.

⁴⁵ Although they are very rare in earlier structures, coursed-masonry deflectors have been found as early as Pueblo I, see Protokiva 1, Site 18, Morris, 1939, p. 60 and pl. 16.

⁴⁶ Morley, 1908, pl. 36.

⁴⁷ Chapin, 1892; Nordenskiöld, 1893; Morris, 1919a; Fewkes, 1922; Martin, Roys, *et al.*, 1936.

⁴⁸ Morris, 1928; Colton, 1939c.

⁴⁹ Brew, 1937, 1939, 1941.

⁵⁰ Simpson, 1850.

Another common feature in the walls was the wall niche, a small cavity, sometimes found open, sometimes found plugged with adobe, encountered in the earth wall either above or, more often, below the bench. Niches of various sizes and shapes occurred in the Pueblo II kivas on Alkali Ridge and were a carry-over from the pit houses. Nothing was found in them and their purpose must be set down as unknown.

This is one case, however, where it seems wise to disregard the caution now exercised over the imputation of ceremonial significance to prehistoric remains. This caution has been forced upon us by the custom, prevailing during the early years of Southwestern archaeology, of labeling as "ceremonial" all objects and features for which the observer could not find a ready explanation. Once having broken this generally wise taboo, we have at least 2 alternatives in regard to the niches. First, a halfway measure, we may suggest that they may have been receptacles for the storage of ceremonial paraphernalia when it was not in actual use. Or we may go the whole way and suggest that some of the niches, at least, may have had ceremonial significance in themselves. After all, we are dealing with buildings which had, by Pueblo II times, become primarily ceremonial and, furthermore, there are both prehistoric and modern parallels which may be of value in assigning function to the niches.

In Kiva A at the Pueblo III Village of the Great Kivas near Zuni, New Mexico, Roberts uncovered a large wall niche, with a stone lintel, in which he discovered the remains of what appeared to have been prayer sticks.⁵¹ He suggests the possibility that the niche may correspond to the Katsina niche of modern Hopi and Acoma pueblos. He concludes his discussion with the statement: "It is possible that the same idea prevailed there as at Acoma; namely, that the gods could be reached through that opening and that gifts to them properly belonged there."

Other possible parallels are the niches, usually containing pots set in aslant with mouths opening toward the kiva, found in the riser of the bench in the "southern" recess of Pueblo

IV and seventeenth-century kivas at Awatovi in northeastern Arizona. Hopi workmen excavating these kivas considered them to have the same function as similar installations in modern kivas. In the latter, offerings for the gods are placed in the niches not only during ceremonies but at any time. For instance, when fruit is being eaten in the kiva, a few of the seeds are placed in the niche for the gods.

The final development to be discussed in the progression toward the standard Mesa Verde kiva of Pueblo III is the southern recess. This is one of the recesses which occur in the circumference of the kiva, above the bench, between each pair of pilasters. It is the one under which the horizontal ventilator shaft passes. In many of the Alkali Ridge kivas, the southern recess was no deeper, or but little deeper than the others. Sometimes, however, it was much deeper as shown in the kiva at Site 11. This depth is more fashionable, apparently, in Pueblo III kivas, and it is of value to note that the deep southern recess at Site 11 represents a late remodeling accompanied by the introduction of an advanced type of pilaster, as described on page 144. The theory that the enlarged southern recess represents a survival of the "south end," the section south of the partition wall in the main room, of pit houses has already been mentioned. It has also been suggested that it may be a survival of the southern antechamber of the pit house. Both of these theories are quite possible. It should be noted, however, that on Alkali Ridge, at least, a gap in time seems to exist in the early part of the Pueblo II period, during which the subterranean structures had neither "south ends," southern antechambers, nor southern recesses deeper than the other recesses. The peculiar construction in Kiva 2, the earlier kiva at Site 12, can hardly be labeled as any one of the three. Yet it may be part of the transition. It is also possible, of course, that an unbroken transitional series may appear elsewhere, and that the enlarged southern recess may have returned to Alkali Ridge after having been developed in some other locality as a continuation of one of the 2 architectural features mentioned above. I think, however, that the possibility should be enter-

⁵¹ Roberts, 1932, pp. 60-61.

tained that the enlarged southern recess may have been an entirely separate Pueblo II development to provide extra space, for some reason or other, in that part of the kiva. In other words, perhaps it should be correlated with the new style built-in ventilator unit as opposed to the old style tunnel-type ventilator.⁵²

We have now seen, during the period known as Pueblo II, the development or appearance on Alkali Ridge of almost all of the important features of the standard Mesa Verde kiva of Pueblo III. In terms of classificatory period diagnostics we can repeat the statement made earlier in the report that kiva development was considerably ahead of pottery and house type. The Mesa Verde kiva, in all its basic aspects, with the exception of the underground passageway from the kiva to the house, occurs in Pueblo II.

Certain refinements were added in Pueblo III and the passageway, just mentioned, which was described by Prudden and which is

shown by him in a conjectural reconstruction model,⁵³ became a common feature during that period. Masonry deflectors increased in popularity as did the large southern recess. Coursed-masonry facing for the kiva walls also seems to have become increasingly fashionable. A certain amount of caution should be applied here, however, since a large proportion of the known Pueblo III kivas are in the cave houses in the Mesa Verde proper, where they are usually built in the back fill of previous refuse and consequently would have need of fabricated walls.

All other distinctive features, the circular form, the encircling bench, the large "expanding" pilaster, the large southern recess, the wall niches, the built-in masonry ventilator unit, and mural paintings have now been found in early kivas, and we have been able to trace the development of many of them, on Alkali Ridge and in other parts of the San Juan, from architectural forms found in even earlier pit houses.

⁵² See pp. 208-09.

⁵³ Prudden, 1905.

THE DEVELOPMENT OF HOUSE ARCHITECTURE

The architect who built this window, and all other windows on that side of the house, is said to have suffered horribly. The windows are of thick plate glass, some of them almost six feet square.

"But you simply *can't* have windows like that in an English brick house!" the architect protested.

"Why can't you?" my father-in-law asked.

"It isn't *done*!"

"Well, it's time someone began. I'll be damned if I'm going to cut up a good twenty-mile view with those little, leaded, window panes."

— EDMUND WARE SMITH

THERE is something very wrong with our conception of Pueblo architecture. As archaeologists we have presented it as a thing of amazing regularity, with invariable canons of style. We have built a verbal reconstruction of Pueblo towns and ranches with only 2 kinds of buildings at a given time, 1 secular, 1 religious, all built with the die-stamp regularity of the assembly line.

Every active Southwestern archaeologist reading the last paragraph will say: "Of course that isn't so." Yet that is the impression others get from our works. It is current anthropological belief and is taught in universities. In my own observations of both ancient and modern examples of Pueblo architecture, if I have found any rule at all it has been one of uncompromising irregularity. The irregularity runs throughout, in plan, in material, and in method of construction.

At the beginning of my work on Alkali Ridge a prominent archaeologist told me to waste no time digging kivas, as they were full of heavy stones and were "all the same." In our excavations we found no 2 kivas alike. The variation in houses was even greater in degree.

Our difficulty again arises from the demands of classificatory systems and taxonomy. In these systems it is necessary to have a "house type" for each discrete division.¹ Furthermore, in actual practice, the defined diagnostic house types have often not even been house types at all, but wall types. We have been told that the Basket Maker III house type was "slab houses," indicating the use of upright stone slabs in the walls, with no consideration

of the super-structure above the slabs; that the Pueblo I house type was "jacal," upright posts plastered with adobe, held together with cross poles and withes; that the house type of Pueblo II and Pueblo III was coursed-masonry rooms joined together into buildings, small in Pueblo II and large in Pueblo III.

In our work in Alkali Ridge we found all of these "types" of walls in all "periods," from the middle of the eighth century onwards. These findings are confirmed in the material reported by Martin and Morris from southwestern Colorado.²

This does not mean that there were no differences in the walls as the centuries rolled on. Differences were observed, as will be shown presently, but they were of the nature of variations in detail of construction within the gross types. There were also differences in emphasis, in the amount of use of various kinds of walls, and in the correlations between wall type and building function. For instance, after coursed-stone masonry became the most fashionable thing for living rooms, jacal and brush construction was apparently used for turkey pens and various structures, such as wind-breaks, attached to the living rooms, just as in Pueblo towns today.

Modern analogies are considered dangerous by some, but I think it would be unwise to ignore the situation in the Southwest today, where ranch establishments and pueblos consist of from 4 or 5 to 20 different structures of varied wall type. Furthermore, the variations in wall type and in other architectural features do not all follow or contribute to definite trends or patterns. Many of them are of the

¹For a discussion of this taxonomic peculiarity, see footnote 13, page 37.

²Martin and Rinaldo, 1939; Morris, 1939.

nature of the one cited in the quotation at the beginning of this section. These are individual rebellions, idiosyncrasies, make-shifts caused by poverty or cataclysm, or variations arising simply from architectural or structural incompetence, and there is no place for them in the pigeon-holes of taxonomy. Yet they are the very life-blood of "progress." For, every once in a way, one of them catches the fancy, and that which originally was an individual idiosyncrasy becomes the mode for a large number of people, perhaps for a long time. Then it becomes "legitimate," becomes part of the system, and is "recognized" by taxonomy as the house type of a period. But, as our evidence clearly shows, to the contemporaries it is just one of a number of ways to make a building, albeit the most popular one of the moment for certain purposes.

As in the case of kiva development, we take the houses of the period known as Basket Maker III as the point of departure and, in part, we start with the same structure, the pit house. For the pit house of Basket Maker III, while responsible for many of the architectural features of later kivas, at the same time fulfilled part of the functions of the later houses. It seems to have been the domicile which housed the family and to have provided shelter for much of the industrial activity. There were other buildings present at sites of this age, however, which are more important, architecturally, in the present discussion. These were the isolated, usually slab-lined cists, which seem to have been for storage, particularly of grain, and which are pictured and described in Roberts' report of his excavations at Shabik'-eshchee village.³ From them came the storage function of the later houses and the first popular wall type. In this case we can trace the architectural tradition further back to the oval and circular slab-lined cists, usually smaller, of Basket Maker II, found in caves in various parts of the Southwest,⁴ where they were at first called "dwellings," a theory which now seems to have been erroneous.⁵ Morris is now beginning to find the contemporary houses which, as he has long suspected,

are similar to their successors, the pit houses of Basket Maker III.⁶

To trace the development of Pueblo house architecture in its baldest outline: the small oval and circular slab-lined storage cists of the Basket Maker II period in the Pecos Classification developed into the similarly shaped larger storage chambers, still isolated, which are considered to be diagnostic of Basket Maker III. Then these storage chambers were put together, at first crudely with little change in form or construction, and large, irregular rooms were attached to series of 2, 4, or 6 of them. The new rooms provided domicile and represented a coming up out of the pit houses of some of the aspects of family life. Soon the storerooms, by then contiguous, were squared up, the outside walls were aligned, and a single common wall served as partition between them. A single common wall also served as partition between the storage rooms and the new-style living rooms. The living rooms at the same time became more regular and the 2 kinds of rooms appeared as long double rows, usually arranged in a slight curve, with the storerooms at the back and the living rooms in the front, generally facing the south.⁷ In a plaza in front of the latter, or at the ends of the rows, were the pit houses, by then smaller, deeper, and more closely resembling in form and specialized function the kivas into which they were to develop. Other small buildings, sheds, pits, bins, etc., were to be found in the plazas, as well, but the main line of development for Pueblo house type was fairly well set.

From this point on a number of trends can be followed. First, the storerooms and the living rooms began to draw together in size, shape, and function until they became indistinguishable in the ground plans of Pueblo II, III, IV, and the present.

Second, the fashions in wall construction varied considerably throughout Pueblo I, passed through a short stage in Pueblo II when jacal walls were preferred in localities where juniper poles were readily available, and became fairly well standardized finally in various styles of coursed masonry in different parts of

³ Roberts, 1929.

⁴ Pepper, 1902; Nusbaum, Kidder, and Guernsey, 1922; Kidder and Guernsey, 1919; Guernsey and

Kidder, 1921; Guernsey, 1931.

⁵ Morris, 1939, p. 17.

⁶ Morris, 1941.

⁷ See fig. 27, facing p. 152.

the San Juan in Pueblo III. Walls of out-buildings and occasional walls in the main house "blocks" were still built in early styles at that late date.

Third, the double row tradition was partially superseded, for large accumulations, by more massive structures or "blocks" wherein rooms were built on to an original "core" on all sides. The double row continued to be the style for the small houses, of from 4 to 12 or 16 rooms and sometimes even more, throughout Pueblo III in the Mesa Verde.

Fourth, at some time during the development upper stories appeared, reaching a height of at least 5 stories but usually of 2, 3, or 4, arranged in irregular terraced form. The date at which the upper story appeared is unknown. Morris thinks it occurred very early, not long after the inauguration of the style of long double rows of contiguous rooms.⁸ He believes that originally the second story was restricted to the rear row, that is, to the storerooms only. The evidence, however, is not conclusive and the custom does not seem to have become popular before the larger unit-type buildings of early Pueblo III. Morris bases his suggestion upon the amount of cultural material found in the fill of the rooms in such position that it must have been on top of the roof when the structure burned. Similar finds were made at Site 13 (p. 194). This material could have been on the floor of a second-story room, as Morris suggests, but it also could have been on the roof of a 1-story structure. It seems probable that roofs were used then as they are today in the Pueblos of the Southwest where many of the household tasks are performed on the roofs. It is even possible that the roof was used more in early times than it is at present, if the theory is correct that most Pueblo houses in the past were entered through a hole in the roof. The roof then, in function, becomes the doorstep, the front porch, and the back yard. The entrances to the houses in the long rows may well have been through the roofs of the living rooms with doors from those rooms into the storerooms as suggested on pages 194-95. The walls of the storerooms at Site 13 on Alkali

Ridge (pp. 191-93) certainly do not seem practical for a second story. They were 20 centimeters or less in width, and the material bearing the load, above the base slabs, was adobe. Even below the tops of the slabs the thick adobe plaster must have borne some of the load. The corner posts, too, were small, 8 to 20 centimeters in diameter, with a majority of them under 15 centimeters. This would have been a flimsy foundation for a second story.

The developments just outlined can be traced on Alkali Ridge and in sites described by others in the Mesa Verde area and elsewhere in the Southwest. References have already been given to the beginnings, as far as we now know, in the slab-lined cists of the Basket Maker II caves. The first expansion is seen at Shabik'eshchee in Chaco Canyon where Roberts shows a Basket Maker III village of 17 pit houses, a large kiva, and 48 isolated storage pits.⁹ Four of the pits, numbers 12, 13, 14, and 15, were adjacent to a large irregular structure which Roberts calls a "court," with 2 firepits in the floor and walls of upright stone slabs. Pits 13 and 14 were crudely oval in shape and their walls almost touched at one point where they were separated by less than 5 centimeters. Furthermore the wall of pit 14 came, at one point, within 10 centimeters of that of pit 15. There is a very good possibility that the parts of the walls immediately above the slabs may have touched at those 2 points. Although Roberts found no evidence that the "court" had been roofed, the arrangement suggests a close approximation to the contiguous storerooms and adjacent large living rooms with firepits at Site 13 on Alkali Ridge.

The next step was also found by Roberts, in eastern Arizona in the Whitewater district near Allantown in the drainage of the Puerco of the West. Near Pit House 16 of his "Modified Basket Maker" Group 2 there he found 3 slab-lined storage pits of a most significant nature. These were still largely oval in form but were actually adjacent. Two of them, pits A and B, were connected by a doorway at the point of abutment and between pits B and C

⁸ Morris, 1939, p. 27. Morris attributes this possibility to the Basket Maker III period.

⁹ Roberts, 1929, plate 1.

there was but a single *common* wall. Furthermore, C had been *added* to B and the almost pointed end of B, like the end of a football in longitudinal cross section, projected well into room C.¹⁰ There is no mistaking the indication here.

A similar find was made in northeastern Arizona by the Peabody Museum Awatovi Expedition at Jeddito Site 4-A, where a row of 5 contiguous storerooms was found with adjacent large room and associated pit house. One of the storage rooms was oval in shape and rooms had been added on either side which were rectangular except for the walls adjacent to the oval room which followed the original shape of that room. A comparable find was made at Jeddito Site 264 where 19 isolated slab-lined storage pits were found and also 7 others which were in various stages of "contiguity."¹¹

Similarly, at Site 13 on Alkali Ridge, we found a very suggestive situation in the north-south row, where there is a marked irregularity in Rooms 240 to 243. These 4 rooms (fig. 27) were originally oval or irregularly curved in outline, and they had been squared up by the addition of masses of adobe and, in the case of 242 and 243, slabs. More regular rectangular rooms were added on either end of this short row. The alignment is more irregular in that section than elsewhere at the site, and the earlier pits beneath Room 201 are less than 7 meters away.

It, therefore, seems as though we have at last found the beginnings of the Pueblo multi-roomed house. There is still much to be learned about these early structures. At Shabik'eshchee and at Whitewater Roberts found evidence in the fill which led him to the conclusion that the upper parts of the walls were made of poles, brush, and mud. He believes the walls slanted inward and that the roof was flat so that the buildings resembled truncated cones in appearance, while they were still virtually separate entities. Soon after they were joined together, however, the walls must have been straightened.

Almost immediately, apparently, the standard form shown in the majority of rooms at Site 13 on Alkali Ridge developed. Roberts found a row of 5 rectangular storerooms in association with Pit House 15 at Whitewater. In front of, and adjacent to 2 of them, was a slab-walled structure, which Roberts calls a "shelter," with a firepit in the center. He does not believe that it had been roofed. However, there is no question about the presence of roofs for rooms in similar location in the Mesa Verde region. Room 220A and Room 222A at Site 13 on Alkali Ridge both had roof-support posts, as had the living rooms at Martin's Site 2 in the Ackmen-Lowry region in Colorado.

The "place of origin" of this development is at present unknown. It can be seen "in process" in the Allantown and Jeddito regions of northern Arizona and in the San Juan in southern Utah. Further conclusions must await more definite dating.

The next step is the appearance of coursed construction above the slabs forming the bases of the walls in the storerooms. The walls of alternating courses of stone and adobe found at Site 13 on Alkali Ridge have been described on page 191, and the lower horizontal course of stones above the upright slabs is to be seen in figure 93, *a*. Similar super-structure is described and pictured by Morris in his La Plata report,¹² and it has been found in the University of New Mexico excavations at Site BC 50 in Chaco Canyon.¹³ Much of the wall construction in the large buildings at Pueblo Grande in Nevada is of this type, and Harrington illustrates a well-preserved example.¹⁴

The sites had by then become quite large. Site 13 is the largest yet excavated, but I have paced similar sites which are much larger in company with J. A. Lancaster on Horsehead Mesa on the Utah-Colorado line and with Lancaster and Don Watson on top of Mesa Verde proper. Martin excavated 62 storage and living rooms and 8 pit houses at his Ackmen-Lowry Site 2, which represented about three-fourths of the site,¹⁵ and Morris has

¹⁰ Roberts, 1939, p. 150.

¹¹ Material in preparation at the Peabody Museum.

¹² Morris, 1939, p. 58 and plate 14.

¹³ Kluckhohn, Reiter, *et al.*, 1939.

¹⁴ Harrington, 1927, plate XXXV, B. The wall

shown by Harrington is similar to our Site 13 Type III (p. 191) with alternate courses of stone and adobe throughout and without the upright slabs at the base.

¹⁵ Martin and Rinaldo, 1939.

excavated parts of similar structures at his La Plata Sites 18, 23, 25, 33, and 39.¹⁶ It is quite apparent that the Pueblos did not wait until Pueblo III for the sanction of the Pecos Classification to build large houses.

Perhaps the earliest example of this approximation to coursed-stone masonry is that found in a Chaco Canyon pit house by Roberts. In House A at Shabik'eshchee on one side of the passageway between the main room and the southern antechamber the height of the wall had been increased by laying "horizontal slabs" in "thick masses of adobe mortar" above the vertical slabs.¹⁷

Roberts also found walls of alternate courses of stone and adobe above a base of upright slabs in 2 units of his "Developmental Pueblo" village in the Whitewater district in Arizona.¹⁸ The units were small, of 5 and 6 rooms respectively, but arranged in the same fashion as the large structure at Site 13 on Alkali Ridge. The storerooms were in the rear; in front of them were adjacent large living rooms with fireplaces; and in front of the above-ground structure was a pit house. The walls were much thicker, however, than those at Alkali Site 13, and the stones in the coursed sections were much larger. The tree-ring dates from the Developmental Pueblo Units at Whitewater in mid-nineteenth century seem to place them at least 100 years later than the buildings with walls of alternate courses of stone and adobe on Alkali Ridge.

To continue with the development of these walls, the final step, in typological terms, was the appearance of "true" coursed masonry, without a slab base and with the stones bearing the load. This kind of wall has been found by Martin at Ackmen-Lowry Site 1,¹⁹ and at that site there was much less difference in size and appearance between the rooms in the 2 rows. Firepits were by that time (ca. 860 A.D.) found in the rooms in both rows. The associated subterranean rooms were still of a type which is described by the term "pit house." Roberts also found true coursed masonry at Whitewater in above-ground rooms in association with pit houses in the "Modified Basket Maker" Group 1, but that part of the site was so badly eroded that little

detailed information about these rooms could be obtained.²⁰ However, the whole gamut of this development seems to be present both in the San Juan in Utah and Colorado and in the Puerco of the West in Arizona.

With Ackmen-Lowry Site 1 we have approached very close to the kind of building usually described as "Unit type." Before going on with house development, it might be well to consider the extent of sites with the village plan and architectural forms we have been discussing. They have now been found in an area in Utah, Colorado, New Mexico, Arizona, and Nevada which is over 200 miles square. In much of that area they are very numerous. From surface indications they seem to be the most extensive ruins in the Mesa Verde area, including the top of Mesa Verde itself. Although we have insufficient evidence at present for anything approaching a reasonable population estimate, it is possible that there were more people living in the Mesa Verde area at the time such villages were occupied than during any other prehistoric period.

If such is the case, the question may well be asked, why has this kind of village been so little known to archaeologists? The answer is a simple one. Until recently archaeologists in the Mesa Verde region, with the exceptions of Morris and Kidder, have either ignored these sites or missed them, concentrating on the Pueblo III establishments with large house mounds and obvious kiva depressions. The earlier sites present much less noticeable surface indications with no great rock piles upon them, and the pit houses are filled level with the ground. Furthermore, they are often covered by a thick growth of juniper and pinyon trees, unlike the later units which are easily spotted as sage-covered "clearings" in the forest.

In this respect, again with the exception of the two noted above, archaeologists working in the area between 1880 and 1925 were not so observant as the men who conducted the first reconnaissance, covering the whole region rapidly, and burdened with other duties besides archaeological ones. Describing a site at the confluence of the Yellowjacket, which he called Hovenweep, and the McElmo, W. H.

¹⁶ Morris, 1939.

¹⁷ Roberts, 1929, p. 15.

¹⁸ Roberts, 1939, plates 20-22; fig. 44.

¹⁹ Martin and Rinaldo, 1939.

²⁰ Roberts, 1939.

Jackson wrote in 1878: "... we found a perfectly flat surface, 100 yards in width, by about 200 in length. . . . Almost the entire space . . . was covered by an extended series of small squares, formed by thin slabs of sand-rock set on end. . . . There were also a few circles disposed irregularly about the enclosed area."²¹

W. H. Holmes in the same year described similar sites and emphasized their size and the great number of them in the region. He wrote: "In these places considerable areas, amounting in some cases to half an acre or more, are thickly set with rows of stone slabs, which are set in the ground and arranged in circles or parallelograms of greatly varying dimensions."²² The only person who seems to have paid any attention to these statements in the Jackson and Holmes reports was Victor Mindeleff, who did no work in the Mesa Verde but who quoted their descriptions of slab villages in his study of Pueblo architecture.²³ The archaeologists working in the Mesa Verde were too busy cleaning out the extensive cliff houses to bother with slabs and a few inches of charcoal and potsherds. And I do not think we can blame them. Their choice was a good one at the time. It is only to be deplored that they did not overlook a few of the large cave sites, as well, so that some of the great wealth of "perishable material," cloth, clothing, wooden objects, etc., which at that time remained in them, might have been preserved for stratigraphic excavation.

After the latter half of the ninth century, when units like those at Ackmen-Lowry Site 1 were being built, it would be natural to expect that development proceeded directly with the perfection of coursed-masonry through the Pueblo II units to the beautiful stonework of the towers of the Hovenweep and the McElmo²⁴ and the striking combinations of large stones with very small stones in bands which is called Chaco masonry.²⁵ This seems to have been the case, but other things were happening, too, in house building.

In many parts of the Mesa Verde area jacal construction became the most fashionable

style. Roberts has uncovered extensive villages of jacals in the Piedra drainage, east of Durango, associated with pottery predominantly of the type classified as Pueblo I with a small amount of what might be called early Pueblo II corrugated ware.²⁶ Similarly, Site 9, most of the above-ground buildings at Site 12, and the earlier house at Site 11 on Alkali Ridge were of post-and-adobe construction. In his Piedra report Roberts traces the distribution of jacal construction down the San Juan River on both sides from a point 25 miles east of the Piedra River. It has been found in Frances, Burns, and Gobernador Canyons; near Allison west of Arboles; in the Pine River drainage; and in the Animas Valley from north of Durango to the mouth. Morris found it in the La Plata²⁷ and it has been located as far west as Beaver, Willard, and Paragonah in southwestern Utah,²⁸ and in the Muddy and Vergen valleys of southeastern Nevada, where Harrington has located it. The most striking example in Nevada was found by Harrington²⁹ at Pueblo Grande where he uncovered a many-roomed jacal building with attached "shelters" which may be correlated with similar "shelters" at Roberts' Piedra sites, and also with the "living rooms" at Site 13 at Alkali Ridge, at Ackmen-Lowry Site 1, and at Morris' La Plata sites of the type just described.

A large number of these sites are not accurately dated, but many of them seem to be roughly contemporaneous from the nature of the pottery found. The reason for listing them now is to indicate that we probably have to deal here, as in the case of the contiguous-roomed slab-walled structures, not with isolated local variations but with a widespread fashion. The most unfortunate aspect of this style of building is that it is not readily identifiable in surface surveys. Few archaeologists are familiar with the surface indications of such sites and even those who are would not, in many cases I believe, care to give much weight to their observations without confirmation by excavation. When it is remembered that structures with such outstanding surface indications as the ball courts of south-

²¹ Jackson, 1878, p. 414.

²² Holmes, 1878, p. 385.

²³ Mindeleff, 1891, p. 147.

²⁴ Fewkes, 1919a.

²⁵ Hawley, 1938.

²⁶ Roberts, 1930.

²⁷ Morris, 1919a.

²⁸ Judd, 1926.

²⁹ Harrington, 1927, p. 267.

ern Arizona were entirely overlooked until recently,³⁰ simply because archaeologists did not know the surface indications, I think that we must not disregard the possibility that jacal houses may exist in any part of the Pueblo area where the timber growth was present to supply the posts.

Variations existed, too, in the methods of constructing these jacals, although at present, because of lack of excavation, we can not tell how many of them were chronological variations and how many were merely geographical or "cultural." It is to be expected that we shall eventually find both these factors operating.

The difference, on Alkali Ridge, between the post-and-adobe walls at Site 13 (Type IV) and those at Sites 9, 11, and 12 have already been described (p. 191). The walls of Roberts' Piedra sites differed from each of these 2 types. Their closest resemblances were with the jacal walls of the Alkali Pueblo II Sites 9, 11, and 12. In his description of the Piedra jacal villages, Roberts lists 3 building types:³¹

Class A: sloping walls braced against side of pit by heavy log along floor.

Class B: perpendicular walls with poles set in trench and braced by stones.

Class C: a combination of Class B with small, usually 2-room masonry structures.

At first glance there would seem to be definite parallels between the last 2 classes and some of the Alkali Ridge sites. In ground plan, certainly, Site 9 resembles the Class B village in the Piedra, and the kivas present striking parallels. Site 12, on the other hand, seems very similar to the C type of Roberts.

A close scrutiny of the evidence from both areas, however, reveals many differences, as follows:

a. The Alkali houses were not built in shallow, straight-walled pits. The floors were all at ground level.

b. The wall posts on Alkali Ridge were not placed in a trench but were inserted into the ground at ground level. In Piedra Type B, only the corner posts are shown inserted.³²

c. Corner posts on Alkali Ridge were no larger than the other posts of the walls.

d. The nature of the adobe between the posts in the 2 regions was decidedly different. The small poles, twigs, and small stone fragments found on Alkali Ridge were not present in the Piedra houses. The adobe of the Piedra walls seems to have been more like that in the wall between Rooms 5 and 6 at Site 13 (Type IV at Site 13, see p. 191).

e. The walls of the stone buildings of the Piedra "C" type were of much cruder masonry than were those of the 2-room stone house at Site 12 on Alkali Ridge. In the Piedra, the walls were a combination of crude, unshaped stones, river boulders, and large slabs³³ while on Alkali Ridge shaped blocks of sandstone were used, although the shaping was not so well done as in some of the later Mesa Verde masonry.

f. Finally, the pottery associated with the Piedra villages was of the Pueblo I type except that a few corrugated sherds were found, always with type "C" houses,³⁴ whereas all of the pottery found at Alkali Ridge Sites 9, 11, and 12 was of types classified as of the Pueblo II period.

Despite all these differences, however, a cultural relationship probably existed between these sets of buildings. The interesting resemblances between the kiva at Alkali Ridge Site 9 and the kiva at B village in the Piedra add to this probability. Neither of these kivas had a bench, and both had 4 posts set into the floor to support the roof. The evidence of the pottery makes the Alkali houses seem later than Pueblo I. From the corrugated sherds found at C village in the Piedra Roberts draws the following conclusions: "On the basis of the potsherd evidence, it may be concluded that the C houses must have bordered on the Pueblo II period. Perhaps it was during the time when this kind of house was being built that the transition from Pueblo I to Pueblo II took place. The dwellings may not actually have been occupied during the Pueblo II stage but, at least, they were so late in the first stage that it was possible for typical Pueblo II potsherds to find a resting place in them."³⁵ On Alkali Ridge, however, the evidence is conclusive that post-and-adobe houses continued to be

³⁰ Chard, 1940.

³¹ Roberts, 1930, p. 21, *et seq.*

³² Roberts, 1930, fig. 6.

³³ Roberts, 1930, p. 51 and plate 12.

³⁴ Roberts, 1930, pp. 139-40 and plate 36.

³⁵ Roberts, 1930, p. 140.

built and occupied by a group whose pottery industry had passed from Pueblo I styles into those considered to be diagnostic of Pueblo II.

The most important aspect of the Alkali post houses was the use of stone in the walls and the apparent overlapping of the 2 methods at Site 12. Compared with the Piedra houses, these in southeastern Utah presented an increasing use of stone in connection with the posts. At Sites 9 and 11 the stones were but small fragments mixed with the adobe, presumably to give it added strength.³⁶ In the post houses at Site 12 the stones, when present, were much larger (fig. 88, *d*). Because the posts were set firmly into the ground, because the stones were sometimes superimposed, and because some of the houses apparently did not have them at all, it seems probable that the functional contribution of the stones in holding the posts erect was not of primary importance on Alkali Ridge, as it seems to have been in the Piedra. That the initial introduction of large stones into post-walled structures was for that purpose seems highly probable.

The most interesting new contribution to the problem was the stone house at Site 12 on Alkali Ridge which had occasional posts of varying heights in the walls (figs. 25; 88, *c*). Upon the findings in that house a hypothetical line of development for coursed-stone masonry can be constructed which is quite at variance with that presented earlier in this section. If the posts should be removed from the walls of post-room G at Site 12 (fig. 88, *d*), the remaining stones would offer a certain resemblance to the first course and part of the second course of a masonry building. This resemblance would be of no significance whatever if it were not for the presence, within a few feet, of a coursed-stone house with 9 posts in the walls. The questions suggested may be stated as follows: Is it possible that we have here the development of coursed masonry from the stones placed at the bottom of the wall in post houses to help support the posts and add strength in general to the walls? Did the conception of coursed masonry arise from increasing the number of these stones until it was realized that a wall might be built of them

alone without the use of posts? Were the first attempts in this direction mistrusted to the extent that, although most of the wall was purely of coursed masonry, a few posts were provided (as in fig. 25) in case the adobe mud alone should prove insufficient to hold the stones in place?

It seems hardly probable that the occurrence of posts in the masonry wall should be entirely fortuitous. Supposing, for a moment, that the builders decided to erect a stone house upon the skeleton of a burned post house with 9 charred posts still standing to varying heights. That these posts would not be removed during the raking off of the rest of the debris (adobe, burned beams, etc.) is highly unlikely. The weight of evidence indicates that the posts were set in place by the actual builders of the stone house.

The possibility that the process just outlined was a developmental one resulting finally in coursed masonry seems to be immediately ruled out because of the presence of coursed masonry at Ackmen-Lowry Site 1 dated in the latter half of the 9th C. and apparently developing directly out of 8th C. alternate-coursed stone and adobe walls like those found at Ackmen-Lowry Site 1 and at Alkali Ridge Site 13. If we had only to deal with a local culture bordering the present Utah-Colorado state line, the theory could be so ruled out. However, we must take other factors into account.

The most important of the other factors is the claim by Gladwin and others that the Mancos pottery style and perhaps corrugation may represent influence from the south. It is implied that this may have been accompanied by actual migration. In support of this theory it can be stated that the earliest pottery wares in the San Juan which closely resemble the Mogollon Red-on-brown wares in design are some of the Black-on-red types found in the Pueblo II sites. It is possible that the situation at Alkali Ridge Site 12 may represent experimentation with stone masonry by a group of people not familiar with the architectural traditions of the Abajo and La Plata sites. The difficulty with this theory is that from the

³⁶ Jacal construction at Pueblo Grande in Nevada was similar to this. "... adobe and stone mixed, strengthened and supported internally by imbedded

mesquite or screw bean poles, or bundles of willow sticks, or both. . . ." Harrington, 1927, p. 267.

findings of Roberts and Haury, in the immediate "south," the Puerco drainage and the Mogollon rim, whence the "immigrants" should have come, coursed masonry is also early and followed the same line of development as that shown at Alkali Ridge Site 13 and in the Ackmen-Lowry sites.

The value of the above argument is mainly in its revelation of the complexity of the problems involved. Many more "angles" could be discussed, but I fear not profitably at present. Our crying need is more excavations with associated dates in all parts of the Plateau.

The coursed-masonry buildings at the Pueblo II sites excavated on Alkali Ridge were very small, but it is important to note that they were usually if not always supplemented by other types of buildings. Single-room buildings were found at Sites 3, 5, 8, and 11; 2-room buildings at Sites 7, 11, and 12. The main building at Site 3 had 3 rooms and possibly 4, the largest coursed-stone structure found on a site without Mesa Verde Pueblo III pottery on Alkali Ridge.

With the exception of the house north of Kiva 2 at Site 5, the masonry in the walls of these buildings was very similar to that in the small Pueblo III Mesa Verde units dug. This was not particularly fine stonework, the height of the stone-worker's art apparently having been expended on the kiva. Considerable variation occurred between sites with regard to the degree of care taken in trimming stones and aligning them in courses. The average stone size was 35 by 20 by 10 centimeters, with a usual range in length of 15 to 50 centimeters. Along with these blocks a large number of spalls were used to help compensate for irregularities and to prevent too much dependence upon the binding qualities of the adobe mud in which the stones were set. The walls appeared to have been plastered but since, in many cases, only the lower course remained *in situ*, little satisfactory evidence of this was secured.

The masonry of these rooms was similar to that described by Roys,³⁷ under the heading "Lowry Block-like Masonry Technique (Non-Chaco)" in the report of the excavation of Lowry Pueblo, and similar to that described by Hawley as "Pueblo III Crude Rubble

Without Core" in the Chaco Canyon.³⁸ Roys calls it a "dry masonry technique with voids filled with mud." As Montgomery points out, in modern architectural parlance it would be called simply "crude rubble."³⁹ The load was borne primarily by the stones themselves and not by the adobe. This type of wall, improved in appearance by more careful stone-cutting and stricter adherence to coursing, became the characteristic wall of Mesa Verde Pueblo III houses.

The Chaco wall type which Roys calls "stones imbedded between cushions of mud" also appeared in the San Juan at about this time, that is, toward the end of the Pueblo II period, and persisted, with many variations, throughout Pueblo III. This type, however, is not greatly dissimilar in structural principle from the eighth-century alternate mud and stone coursing at Site 13 on Alkali Ridge which is described on pages 191, 218. As in so many other aspects of material culture, great variation occurred in masonry styles in the Mesa Verde area, and these have been disregarded in the ridiculously inadequate categories of archaeological taxonomy.

The rooms in the Alkali Ridge Pueblo II stone houses were all roughly rectangular except the single room at Site 3 and the stone house at Site 5. The rooms were very small, and of almost uniform size whether contiguous or detached. In length they ranged from 2 to 3 meters, in width from 2 to 2.5 meters.

Although the smallness of Pueblo rooms is a well-known phenomenon, these seem particularly small. But throughout most of the year, at least, it is a gentle country, and many of the activities of the household were probably conducted out of doors, as is the case, even among the Caucasian residents, in the region today. The usual absence of fire and other pits inside the rooms and the regular occurrence of hearths in front and alongside of the houses may be construed as evidence that such was the case. Firepits were found in both rooms at Site 12 and in 1 room at Site 11 but not elsewhere. One corner of the northwest room at Site 3 seems to have been walled off, but there is no evidence as to the use to which the restricted section was put.

The primary function of the stone house

³⁷ Martin, Roys, and von Bonin, 1936, pp. 120-23.

³⁸ Hawley, 1938.

³⁹ Montgomery, 1938

was probably for storage. This is indicated by the large amounts of charred corn and broken pottery found in those which had burned. A sufficient number of post holes, fire-pits, and "occupation levels" were found near these buildings to suggest the possible continuance of the earlier "living room" of Site 13 in a less formal or less sturdy structure.

Some of the post holes, such as the 2 west of the west wall of the northwest room at Site 3, were in such position that they may have supported a lean-to or an extension of the roof. The availability of cedar and pinyon poles and of brush for covering supports this supposition. During the 6 months from early May until November the noonday sun may be and generally is very warm. Despite the phenomenal physical stamina and prowess attributed to the American Indian, he probably did not make a habit of sitting out in the broiling sun. The modern Pueblo potter does a large part of her work in the shade. It seems to be perfectly reasonable and almost mandatory, in reconstructing the buildings of these early farm units, to visualize an indefinite number of sage-covered wooden shelters propped against the houses, held up by posts set into the ground. Also, such shelters may very well have existed completely detached from the permanent buildings.

During cloudbursts in the summers and the cold weather of the winters the masonry house probably was used for domiciliary purposes much more than at other times. Furthermore, there was always the kiva, snug, warm and, if the entrance hole was properly protected, dry.

The effect of one other factor upon the size and number of the stone houses must be considered. In the main canyons of the vicinity and in some of the side canyons were many small cliff-houses. They were located, as a rule, near springs, many of them directly at springs. The possibility must not be passed over too lightly that the farmers of the mesatops may have sought protection in the canyons when heavy snows covered the mesas and cold winds swept across the plateau. That such was the case, even if true, would be diffi-

cult to prove. Yet these cave ruins should be closely considered with that possibility in mind. The pottery found in many of them offers no barrier to this theory.

Before leaving the Pueblo II houses, it is necessary to point out that larger Pueblo II ruins exist as shown by excavations at the Lowry ruin in Colorado,⁴⁰ and at Leyit Kin,⁴¹ Tseh So,⁴² and BC 50-51⁴³ in New Mexico, of which excellent reports have been published. The small sites cleared by the Alkali Ridge Expedition represent a peculiar type of selection. We were attempting to find sites definitely earlier than the "Prudden Unit-types" of Pueblo III. Consequently we chose sites which, from surface indications, seemed to have coursed-masonry buildings so small that they could not possibly be "Prudden Unit-types."

The findings of the last 10 years in the San Juan refute completely the theory that "Pueblo II" was a "period of small houses" which "came together" to form the large accumulations of rooms that make a Pueblo III town. Large and small houses existed during the time labeled Pueblo II, just as they did during the time called Pueblo III. And the large accumulations were merely the carrying on and development of the traditional village plan of Basket Maker III and its modified and perhaps somewhat enlarged successor as seen in Alkali Ridge Site 13, Ackmen-Lowry Site 2 excavated by Martin,⁴⁴ and La Plata Site 33 excavated by Morris.⁴⁵ Furthermore, I suspect that careful excavation, which we have never had, of the large pueblos in the Mesa Verde region will show horizons dating well before 1100 A.D., with pottery easily attributable to Pueblo II.

After the appearance of the Mesa Verde pottery design style in the ware known to taxonomy as McElmo Black-on-white, the buildings in the Mesa Verde improved in masonry style as well. As shown in the preceding chapter of this report, the kiva had attained the Mesa Verde standard in ground plan before this. The "Unit-type" as described by Prudden was the result of increased em-

⁴⁰ Martin, Roys, and von Bonin, 1936.

⁴¹ Dutton, 1938.

⁴² Brand, Hawley, Hibben, *et al.*, 1937.

⁴³ Kluckhohn, Reiter, *et al.*, 1939.

⁴⁴ Martin and Rinaldo, 1939.

⁴⁵ Morris, 1939.

phasis on the arts of stone-cutting and masonry. In addition, an underground passageway was added from the north wall of the kiva, above the bench, to one of the front rooms of the stone house. An excellent reconstruction showing the passageway is to be seen in the photograph of Prudden's model published by Kidder in his introduction to *Southwestern archaeology*.⁴⁶

Like so many other traits, however, this passageway can not be used as an absolute diagnostic of the Pueblo III period. It was not new then. It merely became popular then. In his B village in the Piedra, classified as Pueblo I, Roberts found an underground passage from the kiva to the interior of one of the rooms in an 8-room jacal assemblage.⁴⁷

The discussion of Pueblo III house type recently published by Morris⁴⁸ is so complete that I can add but a small amount of confirming evidence. He says: "The characteristic dwelling of early Pueblo III would appear to have been the unit-type house, which, side by side with its derivatives, hung on until the end of the period." Although the Peabody Museum Southeastern Utah Expedition did no digging in obviously "Classic Pueblo III" sites, it did study the surface indications. "Classic Mesa Verde" pottery with carbon paint⁴⁹ was found to be abundant on the surface of many small sites. Our evidence may be added to that obtained by Morris in support of the theory that during the height of the Pueblo III period there were probably many more small Prudden units and small "canyon-head" units in use in the Mesa Verde region than there were large Pueblos.

In this section I have occasionally used the words "assemblies" and "accumulations" for the large Pueblo houses. I have done so with a specific intent. It has been fashionable to speak and write of pueblos as "prehistoric apartment houses." This is not a proper term to use for them, and it gives rise to many misconceptions. An apartment house is, in general usage, a single building, planned as a unit, built all at once, with all parts tied together into a single structural frame, and with all rooms in use simultaneously. No part of that

definition applies to a pueblo, ancient or modern.

A pueblo "block" is not a "single building" in that sense; its form, at any given moment, has not been conceived as a whole; it was not all built at once; there is no basic frame of I-beams or of anything else; and by the time it has reached sufficient size to qualify for the appellation all of the rooms are not in use. A pueblo block is an aggregation of agglutinative units. Those units are often but a single room and seldom more than 4. They are added from time to time and they are not planned until a need for them arises. The new construction I observed going on in the Hopi towns between 1935 and 1940 included several additions to house "blocks." I found none of these additions being built and none projected of more than a single room in extent. This system of building can be traced back to the long rows of storerooms and living rooms at Site 13 on Alkali Ridge where it is quite apparent in the parts of the assembly which remain.

To refer again to modern Hopi towns, I have sat in rooms in the house-blocks and asked questions about the room on the other side of the wall. The replies were, of course, quite varied. Often it was another living room or a storeroom belonging to the unit in which I was visiting, sometimes it belonged to some other unit, sometimes the answer was "There is no room there." Further questioning at this point brought out the information that the room which had been there was now "blocked up" or "filled up." This may have happened recently; it may have happened within the memory of some of those present — "When I was a little girl that Patrick's mother had a room there"; or it may have been abandoned before living memory, for which the stock answer seems to be "a hundred years." In an old house-block many of the interior rooms and some of the exterior ones are abandoned; these are either filled or sealed, or falling into ruin.

Such is the Pueblo "building." When it is considered that this is only one of the forms of shelter to be found in a Pueblo village, the short-comings of our excessively simple typology

⁴⁶ Kidder, 1924.

⁴⁷ Roberts, 1930, figs. 7, 8, and plate 8.

⁴⁸ Morris, 1939, pp. 37 and 39-41.

⁴⁹ Hawley, 1936.

logical classification become clear. The apparent necessity of having a completely distinct single type of house for each "period" seems particularly unprofitable. Even when

the garages, corrals, pig pens, missions, and general stores, all attributable to our influence, are disregarded in a modern Pueblo village, there remains a multiplicity of building types.

REFUSE MOUNDS AND BURIAL CUSTOMS

But what I remember most clearly from that journey was a figure carved from green stone in the temple of Luxor, buried nearly up to the waist in the dust of ages; and, as I looked at it seated there, a woman came from a cottage just at the back of the temple and threw into the temple over a low wall a basketful of small rubbish, so that I actually saw what it was that buries cities.

—DUNSANY.

THE Pueblo II and Pueblo III sites on Alkali Ridge all had refuse mounds in standard Pueblo position to the southeast and south-southeast of the kivas and houses (see site plans). Large Pueblo III sites, such as the main section of Site 1, not excavated by the Peabody Museum Southeastern Utah Expedition, were sizable accumulations. The refuse mounds of the small sites excavated, however, were all shallow, any depth readings in excess of 60 centimeters being unusual. In English measure they ran from 1½ to 2 feet deep in the body of the mound, tailing off to nothing at the edges. They were irregular in shape, ranging from 4 to 18 meters in maximum dimension. Originally they had been higher in the central part of the mound and probably somewhat less extensive in periphery. In most mounds we encountered definite evidence of erosion and also gained the impression that the central section had leveled off with the passage of time.

The contents were a mixture of earth, stones, ashes, animal bones, charcoal, potsherds, and fragments of artifacts. Occasionally a whole bone or stone artifact was encountered which had been discarded or perhaps lost in the refuse, and a few fragments of vegetable material which had not been charred were found. In addition, at Sites 1, 2, 3, 5, 8, and 12, burials were found in the refuse. These were formal interments, with burial offerings, not merely carcasses thrown out on the dump.

The practice of making formal burial in refuse mounds is a common Pueblo trait. It apparently goes back to the beginning of refuse mounds as such. The placing of burials in refuse material, in fact, seems to antedate the refuse mounds, as shown by the burial in the fill of Pueblo I Pit House D at Site 13.¹ All subterranean buildings which fell into disuse

during the Pueblo I Phase of Site 13 were filled with contemporary refuse and Pit House D was one of these. However, we found no accumulation on the surface of Site 13 which could be described as a refuse mound, although in Martin's work in Montezuma County across the Colorado line, 20 to 30 miles to the eastward, refuse mounds were found at sites which might be classified as late Pueblo I. It therefore seems safe to assume that at some time during the transition between the Pueblo I and Pueblo II periods of the Pecos Classification, and between 750 and 850 A.D. of the tree-ring chronology as it now stands, the refuse mound concept came to this part of the San Juan.

It would be interesting to know more of the ideas which governed these burials, such as whether or not the prehistoric Pueblo Indians had concepts in any way similar to our Christian theory of consecrated ground. From the evidence of the grave furniture accompanying the burials we can safely assume that the interments were ceremonial. Beyond that, at present, it seems unwise to go.

The situation with regard to Pueblo I burials on Alkali Ridge is extremely unsatisfactory. Only one was found, and that without offerings. Yet our excavations in the Pueblo I Phase of Site 13 were much more extensive than all our digging in later phases. Morris also had difficulty locating Pueblo I burials, and he informed me that he had found some behind the north walls of the rows of contiguous storage rooms in sites architecturally similar to our Site 13 in the La Plata country to the eastward in southwestern Colorado. Search along these walls failed to reveal burials at Site 13. Morris also suggested a systematic plowing of the region surrounding the site in an attempt to find burial pits which might

Site 9. On the other hand, the placing of formal burials in refuse material is a common trait in Basket Maker II cave sites.

¹We need more evidence before definite conclusions can be drawn, however. No burials were found in the undisturbed refuse mound of early Pueblo II

come to light as discolorations in the prevailing red earth. Sampling lines were laid out and traversed with a 14-inch walking-plow drawn by our slip-team. A few disturbed areas, not visible on the surface, were encountered but no burial pits. Our sole find during this enterprise was the miniature duck-pot (fig. 99, *f*), which was turned up, intact, by the plow east of Pit House A. The method, however, although rather far removed from usual archaeological procedure, seems to be a practical means of checking the mesa-top surrounding a site. It is described here merely because the problem still exists for Pueblo I in this part of the San Juan, and this procedure might produce results at other sites.

No evidence of cremation was found. Fewkes reported a considerable deposit of human bones in "an enclosure" at Cliff Palace and advanced the theory that the practice of cremation was responsible for the usual absence of burials in archaeological findings at Mesa Verde (Fewkes, 1910b). Toulouse in a recent article describes cremations in the Chupadera Mesa country in Central New Mexico and cites Hodge's finds of cremations at Hawikuh and Kechipauan in the Zuni country (Toulouse, 1944). Our inability to find burials at Site 13 naturally led us to consider the possibility of cremation but we found no burned bones at any of our Alkali Ridge sites.

For Alkali Ridge, at least, a new burial trait appears with Pueblo III. Burials continue in the refuse mounds, as in Pueblo II times, but child-burials are also found beneath house floors (fig. 192, *g, m*). Three were encountered below the floor of Room U₂ in Unit 1, Site 13. This trait has been reported elsewhere in Mesa Verde sites. Not all children were so buried, however, for they were found also in the Pueblo III refuse mounds.

The actual burials, as found, with accompanying artifacts, are described in detail in the sections dealing with the respective sites, above. They are to be found at the end of each site description, immediately before the table of taxonomic position of the site. In Site 13, they occur at the ends of the descriptions of Pit House D, Units 1, 2, and 3, respectively. In addition, measurements and observations of the skeletal material and a statement of pathology and anomaly will be found in

Appendices A and B, to follow. Illustrations of many of the burials are in figure 192, and the skulls are shown in figures 190, 191.

Although relatively few burials were found, there was little uniformity in position and orientation as they were placed in the graves (see fig. 46). About all that can be said is that

TABLE 6. Alkali Ridge burial positions.

Position of body	
Flexed to right	9
Flexed to left	10
Extended	3
Spread-eagle	1
Akimbo	1
Position of torso	
On right side	4
On left side	5
Supine	11
Prone	2
Position of face	
To right	8
To left	8
Up	8
Down	2
Correlations of flexure, torso, and face	
Flexed right, torso right, face right	3
Flexed right, torso supine, face right	3
Flexed right, torso supine, face left	1
Flexed right, torso prone, face right	1
Flexed left, torso left, face left	3
Flexed left, torso supine, face left	2
Flexed left, torso supine, face up	1
Flexed left, torso prone, face down	1
Correlations of flexure and face position	
Flexed right, face right	8
Flexed right, face left	1
Flexed right, face up	1
Flexed left, face left	6
Flexed left, face up	1
Flexed left, face down	1
Correlations of flexure and torso position	
Flexed right, torso on right	3
Flexed right, torso supine	5
Flexed right, torso prone	1
Flexed left, torso on left	5
Flexed left, torso supine	4
Flexed left, torso prone	1
Extended Burials	
Supine, torso up, face up	1
Prone, torso down, face down	1
Spread-eagle, torso down, face down	1
Akimbo, torso up, face up	1

few were extended and that most were partially flexed. Tight flexing of all limbs, as in figure 46, *f*, was very rare. Usually, the legs were flexed in varying degrees. It is hoped that the schematic drawings in the accompanying figure 46 will give a useful visual representation of the situation. Table 6 presents correlations, or more properly, the absence of significant positive correlations.

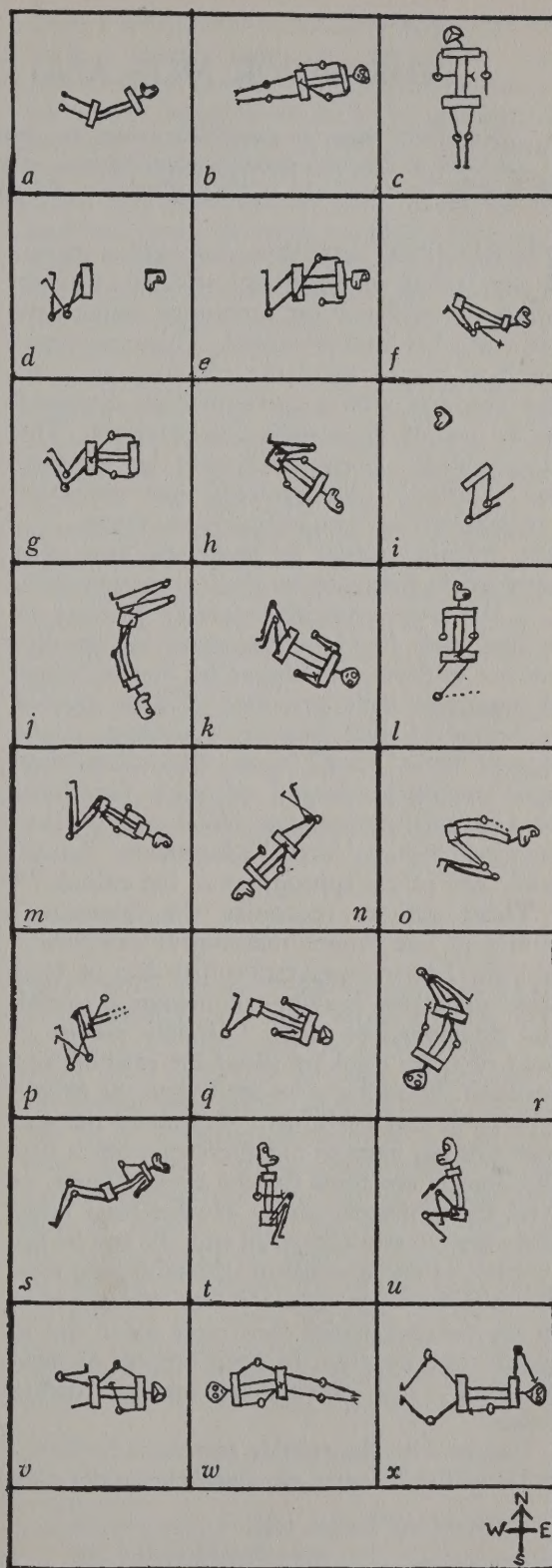
The totals in these tables vary, because it was not possible to observe all the features in each burial. For instance, in figure 46, *i*, the torso was missing, and in figure 192, *k*, a rodent burrow through the upper part of the burial had disarranged the skull.

The only positive information revealed here seems to be that the face was usually inclined in the same direction as that to which the limbs were flexed and that burials were less commonly made with the face down.

FIGURE 46

DIAGRAMMATIC REPRESENTATION OF ALKALI RIDGE BURIALS, SHOWING POSITION AND ORIENTATION

	SITE	BURIAL
<i>a</i>	3	1
<i>b</i>	3	3
<i>c</i>	4	
<i>d</i>	5	1
<i>e</i>	5	2
<i>f</i>	5	3
<i>g</i>	5	6
<i>h</i>	5	7
<i>i</i>	5	8
<i>j</i>	5	9
<i>k</i>	5	10
<i>l</i>	5	11
<i>m</i>	5	12
<i>n</i>	7	
<i>o</i>	8	1
<i>p</i>	8	2
<i>q</i>	12	1
<i>r</i>	12	3
<i>s</i>	13	Pit House D
<i>t</i>	13	Unit 1, Room U2, Burial 1
<i>u</i>	13	" 1, " U2, " 2
<i>v</i>	13	" 1, " U2, " 3
<i>w</i>	13	" 3, double burial, Skeleton 1
<i>x</i>	13	" 3, " " " 2



THE MINOR ARTS AND CRAFTS OF ALKALI RIDGE

No matter what the material or mode, the craftsman works not simply for hire, but for dear life's sake, and as a baker's dozen numbers thirteen, so a piece of handicraft contains not merely the workmanship itself, but a bit of the worker's soul, for good measure. — With apologies to LEWIS MUMFORD

IN RECENT years there has been a growing feeling of discontent with the way in which the evidence for prehistoric minor arts and crafts has been presented. This arises from emphasis placed upon the typology of tools and products with a corresponding disregard of the use of those tools and products. The complaint has been tersely put by Steward and Setzler: "Archaeology has generally avoided treating data in functional terms. . . . The intense interest in specimens *per se* is betrayed in many archaeological monographs, . . . We treat materials primarily as items to be described, listed, and arranged historically, but not as devices employed by human beings in important daily activities. This is implied in the use of such descriptive headings as objects of 'bone,' 'horn,' 'stone,' and others based upon materials, instead of such functional headings as 'horticulture,' 'food preparation,' 'hunting,' 'fishing,' 'dress,' 'adornments,' 'household,' and others appropriate to the culture."¹

These authors recognize the "tentative" efforts to use "more meaningful categories" and cite Linton's suggestion that data be classified under the headings of biological, social, and psychological needs. Certainly we are in need of more thinking about the relationships between the artifacts we study and the people who made and used them. But one of the reasons this has been so much disregarded is that the objects are tools for the archaeologist, as well, in a different sense. He has been using them merely as means to an end, the end he has in view, of dating a site or of establishing relationships between sites, without consideration of the uses for which they were made and to which they were put by their original owners. So used, these objects are merely "dating fossils."

I agree with the opinion expressed by Steward and Setzler that we should consider axes

and grinding stones as "tools employed by human beings in some pattern of behavior." Something should be said, however, for the other side. I believe that the typological studies should not be criticized adversely as long as they are conducted in a scientific manner and produce results, e.g., the relative dating of sites, etc. They can be, have been, and will continue to be of great use to archaeologists in this manner. I deplore the implied condemnation in the quotation I have just made from Steward and Setzler where "the interest in specimen *per se* is betrayed," etc. It is an unfortunate statement in 2 ways: first it is incorrect, for the modern student who describes, lists, and arranges artifacts typologically by forms and materials usually does not do so from an interest in the objects *per se* but with quite different ends in view; and second, because, as I have just stated above, I believe such studies to be practical and useful. In attempting to emphasize their excellent point these authors have been too sweeping in their condemnation of all other kinds of classification. Typologies of form and material are not in themselves evil. They are merely misunderstood and misused, more sinned against than sinning.

Actually, archaeologists must do both. And here we meet the great limitations of time and of space in publications. Fortunately, in the Alkali Ridge work I have an ally, one who has, since the publication of the Steward-Setzler article, produced a magnificent work in the San Juan along the lines suggested. I refer to the La Plata report by Earl Morris.² In the introduction to that report there are 66 pages, large double-column pages of 960 words, which describe the development of Pueblo civilization in the San Juan, from Basket Maker II through Pueblo III in a manner most certainly "functional," producing for us what

¹ Steward and Setzler, 1938.

² Morris, 1939.

might almost be called a living culture. Pages 5 to 45 in the introduction describe the physiography and ecology of the region and the development of the culture in terms of hunting, agriculture, food preparation, house building, minor arts and crafts, and general village life. The fact that Morris adheres to the theory of the "Pueblo Invasion" does not in the least detract from the excellence of this presentation. On pages 117 to 143 he describes technology, including the way in which tools were made, the reasons for selecting various materials, and the way in which the tools were used. In addition, he speculates extensively about the attitude of the owners to these tools. Similar information and speculation is scattered throughout the remainder of the text. This accomplishment has been possible through a combination in Morris of an intense interest in how the ancient peoples lived and how they met their problems with an exhaustive knowledge of their country, in which he has lived the greater part of his life to date, *outdoors*. These problems included devising means for obtaining food, shelter, fuel, and recreation, and also for procuring more elusive personal satisfactions in dress and art forms. Morris' knowledge of the San Juan far ex-

ceeds mine; he has excavated many more sites with a greater range in time and a much greater range in area. So, for the time being at least, with regard to the attitudes requested by Steward and Setzler, I strongly recommend that the reader go to Morris. In the pages cited, and elsewhere in that report he will find functional descriptions, better than any I could write, of the kinds of objects shown in the illustrations from Alkali Ridge and briefly described, typologically, in the following pages of this report.

In the descriptions I shall adhere to the traditional divisions of "stone," "bone," and "pottery." However, within those divisions I shall classify the objects, insofar as possible, functionally. The stone and bone will be divided according to assumptions of use. The pottery objects were almost all containers, except for 1 smoking pipe; a few re-used sherds utilized, insofar as can be hypothesized, as scrapers, smoothers, and pendants; and a few clay objects of unknown use.

Our finds are fully illustrated. The extensive captions of the collotype plates at the rear should be read along with the text. Certain details are described only in the captions where the reader has a photograph before him.

STONE IMPLEMENTS³

Until recently there have been very few competent typological studies of stone and bone implements in the Southwest. Many reports which do present a typological classification do not state how many objects of the various kinds were found. The situation, however, is improving rapidly and the careful handling of this sort of material recently by J. C. McGregor⁴ and John Rinaldo⁵ is highly commendable.

Differences in tool types between periods are reflected more in different percentages of occurrence than in absolute presence or absence. There are still but a very few types defined which show clear differences in form within the time range of the Alkali Ridge

sites. Since the theme of this paper is the development of those sites, these are the forms which are of importance to us at present. Actually they were also of great significance to the people who made and used them, for they had to do with the obtaining of and preparation of food. Three implements showed marked changes in form during the development of Pueblo culture on Alkali Ridge from the beginning of the Basket Maker III period to the end of Pueblo III. They were querns or metates of stone, chipped stone arrow-points, and bone end-scrapers or "fleshers." The first two concern us immediately; the last named will be discussed subsequently (see p. 241).

Much of their work is incorporated in this and the next section.

⁴ McGregor, 1941.

⁵ Martin and Rinaldo, 1939.

³I am greatly indebted to Richard Page Wheeler of Huron, Ohio, and Richard B. Woodbury of Washington, D. C., for studies they made, as graduate students, on the Alkali Ridge stone and bone specimens.

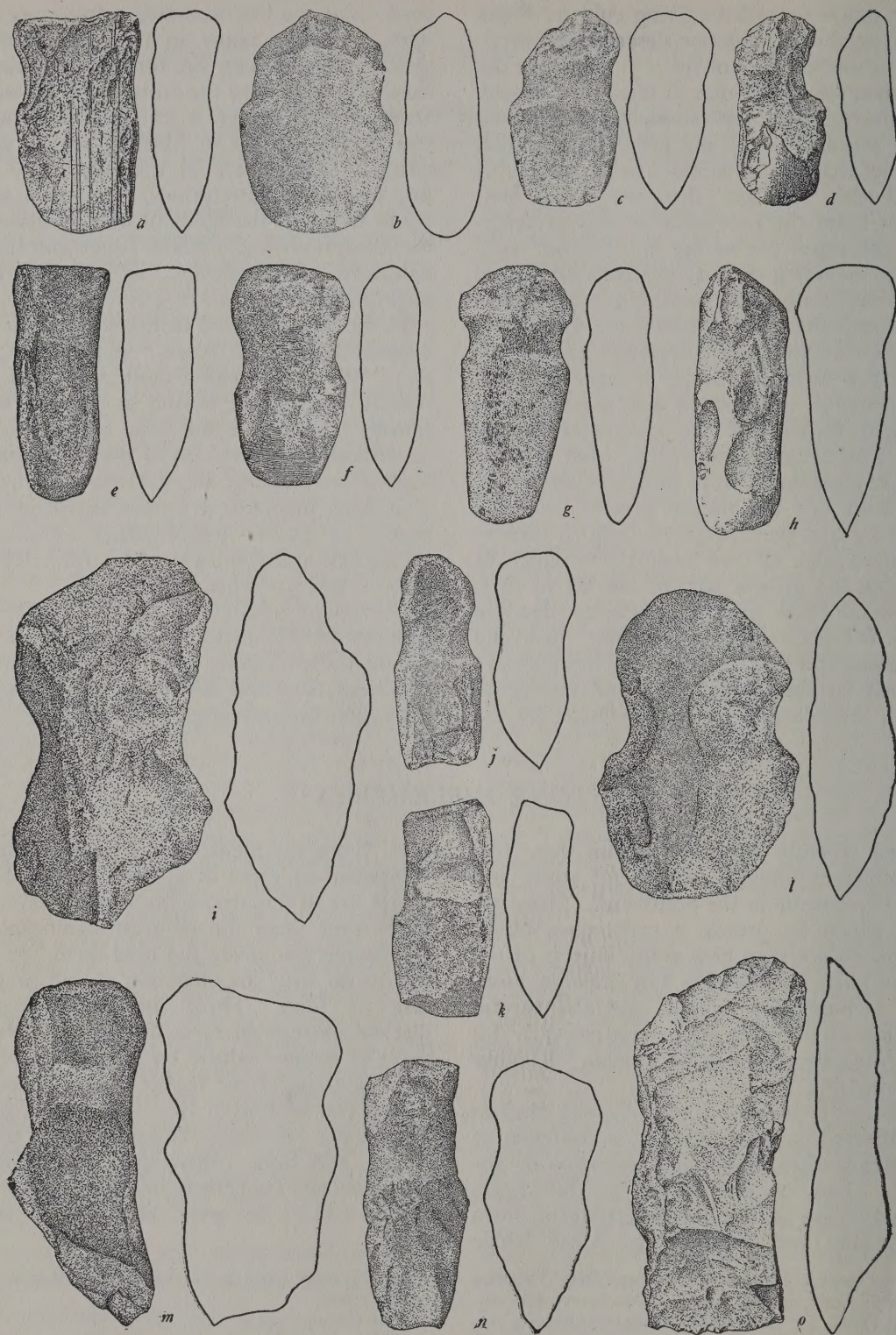


FIGURE 47

Seventy-four whole or fragmentary metates were found in association with the Basket Maker III-Pueblo I (Abajo) Phase of Site 13 (hereafter called Pueblo I).⁶ All of these were of the troughed type, with the trough open at 1 end, and all were of the early form of this type (fig. 174, *a, b, e*). Illustrations of similar metates are to be found in the reports of Roberts,⁷ Morris,⁸ and Rinaldo⁹ all associated with Basket Maker III or Pueblo I sites. The trough was pecked and worn into a crude sandstone slab. The outline of the slab was irregular and little or no attempt was made to smooth or trim any part of the slab except for the grinding surface.

The Pueblo II and Pueblo III metates presented a quite different appearance. To begin with, they were made from much thicker stones. Two types were found in houses of

these periods: "flat" metates (fig. 174, *d, g-i*) with the entire surface utilized for grinding;¹⁰ and troughed metates with the trough open at 1 end, as in the preceding periods (fig. 174, *c*). The latter, however, were trimmed all over into definitely regular shapes.¹¹ The former are the ones found in meal bins. As in modern metates, stones of various degrees of coarseness were utilized for coarse, medium, and fine grinding.

The second significant typological distinction in stone implements was found in the arrow-points. In the Pueblo I levels at Site 13 only tanged arrow-points were found (fig. 172, top row), while in all Pueblo II and Pueblo III sites only notched arrow-points appeared (fig. 172, middle row). Both Morris¹² and Roberts¹³ have found identical typological differentiation between arrow-

LEGEND FOR FIGURE 47

STONE CHOPPING AND POUNDING TOOLS FROM ALKALI RIDGE SITES. Axe terminology follows Kidder, 1932, fig. 23.

No.	SITE	LOCATION IN SITE	SPECIMEN
<i>a</i>	12	refuse mound	chipped and pecked notched axe; ground face.
<i>b</i>	1	Unit 2, kiva, floor	river-pebble maul or hammer; chipped poll and pecked notches.
<i>c</i>	6	kiva, lower fill	full-grooved ground-stone axe.
<i>d*</i>	12	refuse mound	chipped-stone axe; pecked partial groove; partially ground face.
<i>e</i>	13	south of Room 206	axe with pecked partial groove; ground face and side.
<i>f</i>	11	post houses, west end	axe with pecked notches.
<i>g</i>	11	refuse mound	pecked full-grooved axe or club.
<i>h</i>	11	Stone House B	adze; pecked partial groove; partially ground face and side.
<i>i</i>	12	refuse mound	chipped-stone axe; pecked notches; double-bitted.
<i>j</i>	13	Unit 1, kiva, floor	full-grooved axe; chipped, pecked, and ground.
<i>k</i>	11	post houses, west end	chipped and pecked notched axe; face partially ground.
<i>l</i>	13	Room 218	notched axe; chipped, pecked and ground from river pebble.
<i>m</i>	13	Pit House N	axe or adze with hammer-poll; chipped; pecked partial groove.
<i>n</i>	13	Unit 1, Room U3	full-grooved axe; chipped and pecked.
<i>o</i>	13	Room 242A	notched chipped-stone axe; double-bitted.

* Length of *d*, 10.2 cm.

⁶ This apparent awkwardness and uncertainty is a function of our taxonomic system (see pp. 44-66). The main occupation of Site 13 will fit neither Basket Maker III nor Pueblo I in the Pecos Classification. I shall call it Pueblo I hereafter, because it has many traits assigned to Pueblo I and because the few tree-ring dates assigned are in the eighth century, A.D. (see p. 90).

⁷ Roberts, 1929, plate 26.

⁸ Morris, 1919a, fig. 6.

⁹ Martin and Rinaldo, 1939, fig. 109.

¹⁰ Figures 24 and 174, *g-i* show flat metates installed in grinding bins. For good illustrations of flat metates see Roberts, 1932, plate 49, *c, d*.

¹¹ Martin, Roys, and Von Bonin, 1936, plate LXXV; Roberts, 1932, plate 49, *a, b*.

¹² Morris, 1939.

¹³ Roberts, 1929.

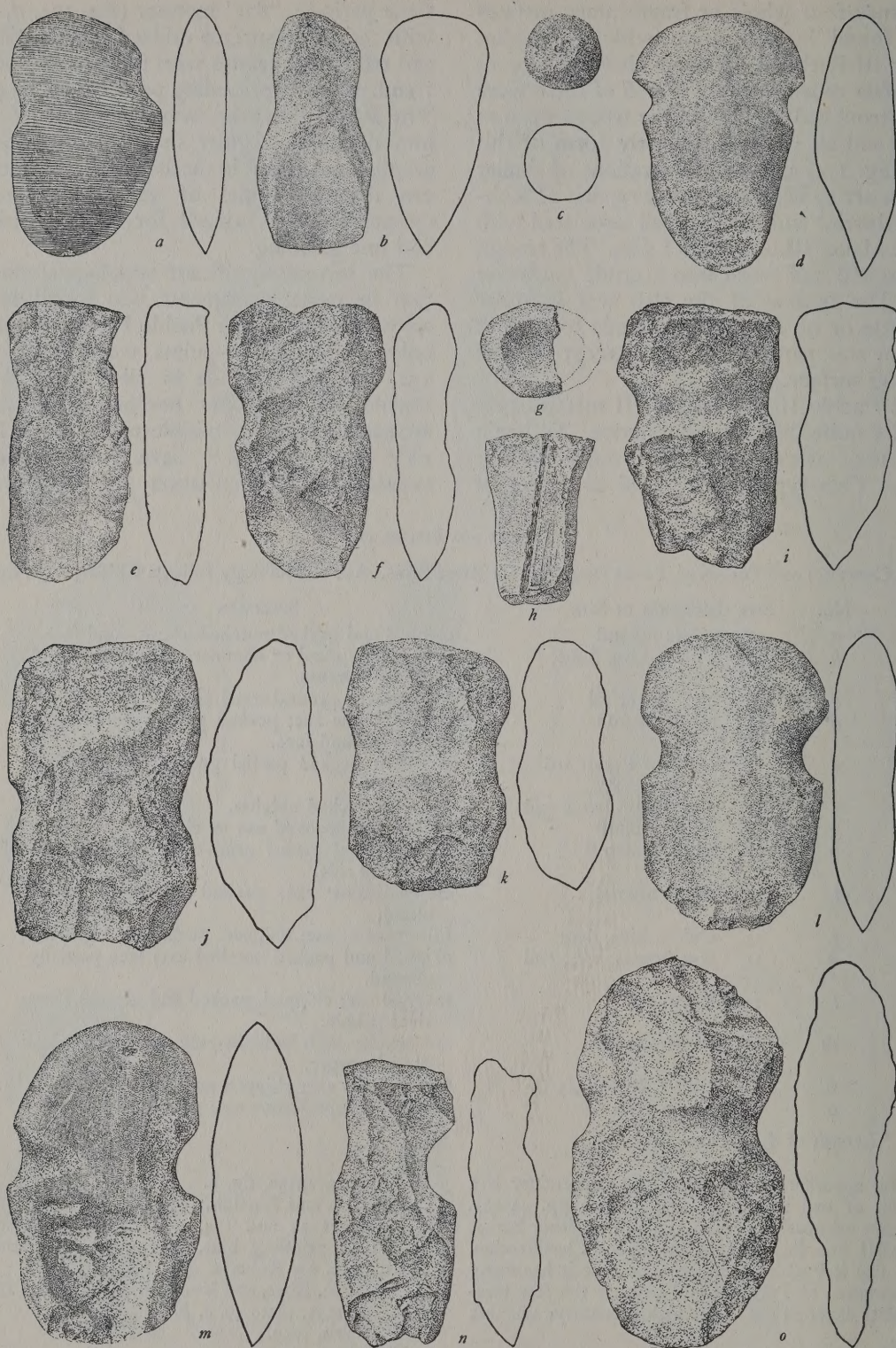


FIGURE 48

points at this stage of Pueblo development. It is interesting to note that, although it has long been a cliché in Southwestern archaeology that stone and bone implements show no chronologically useful variations, the only cultural objects extensively found on Alkali Ridge showing absolutely no typological overlap between our arbitrary periods were the stone metates and arrow-points and the bone fleshers.

CLASSIFICATION

In an attempted functional classification the stone implements from Alkali Ridge have been grouped into the following categories: stone-working implements, wood-working implements, whetstones, agricultural implements, milling tools, piercing and cutting tools, and scraping tools. In addition there are 2 classes of stone objects which were not tools. These are ceremonial objects and ornaments.

It is realized that these attributions of function are not absolute. One of the main hindrances to functional classification of archaeological materials is the generalized nature of many of the specimens. The range of tools at the disposal of the early Pueblo craftsman and householder was relatively small. And even in our days of extensive technological specialization a single type of implement, for instance a screw driver, may be regularly used

for a number of purposes aside from the one for which it was shaped. I ask my readers to think of the number of uses to which they *regularly* apply a screw driver or a knife. Upon encountering disputes as to whether a given implement was a knife or a scraper I think of the thousands of people who may daily be found along the waterfront scraping the scales from fish, with a knife, or in the forests scraping the skins of animals, with a knife. Although, with the addition of tools of wood and leather which we seldom find preserved, prehistoric man had a larger range of tools than he is usually credited with, and although his needs for tools were probably less varied than ours, still most tools must have served a number of purposes which would bridge many categories in any functional classification we could devise.

Stone-working Implements

Picks, hammerstones, mauls, and polishing stones.

Picks. One object was found which can be satisfactorily classified as a pick. It was in a Pueblo II level (fig. 51, *c*), was made of silicified sandstone, double bitted, and notched at the 4 edges of the block from which it was made.

Hammerstones. Hammerstones (fig. 175, *b, i*), made of igneous rock and sandstone, were numerous at all sites. Their shapes were irregular and various. Some of them were the remnants of worn out axes. Two, from the Pueblo I Phase of Site 13, were "pitted hammerstones" (fig. 50, *c, d*). These had small de-

LEGEND FOR FIGURE 48

STONE IMPLEMENTS FROM ALKALI RIDGE

No.	SITE	LOCATION IN SITE	SPECIMEN
<i>a</i>	13	Room 208	notched river-pebble axe
<i>b*</i>	13	" 206	full-grooved ground-stone adze
<i>c</i>	13	Pit House A	pecked-stone spheroid
<i>d</i>	13	Room 297	notched river-pebble axe
<i>e</i>	7	" B	crudely chipped axe; pecked notches
<i>f</i>	11	post houses, west end	notched chipped-stone axe; partial ground and polished face
<i>g</i>	12	refuse mound	pecked-stone dish or small mortar
<i>h</i>	3	" "	grooved whetstone
<i>i</i>	13	Unit 1, kiva, top fill	chipped-stone axe; pecked full groove
<i>j</i>	7	house, surface	crudely chipped axe or maul; pecked notches
<i>k</i>	12	Room L, near floor	chipped- and pecked-stone axe; full grooved
<i>l</i>	13	Room 213	river-pebble axe; notches pecked; edge chipped; face partially pecked and ground
<i>m</i>	13	Room 82	notched river-pebble adze or hoe; chipped, pecked, and ground
<i>n</i>	13	Unit 1, Room U1	notched chipped-stone axe
<i>o</i>	9	house area, surface	crudely chipped axe with pecked notches

* Length, *b*: 12.3 cm.

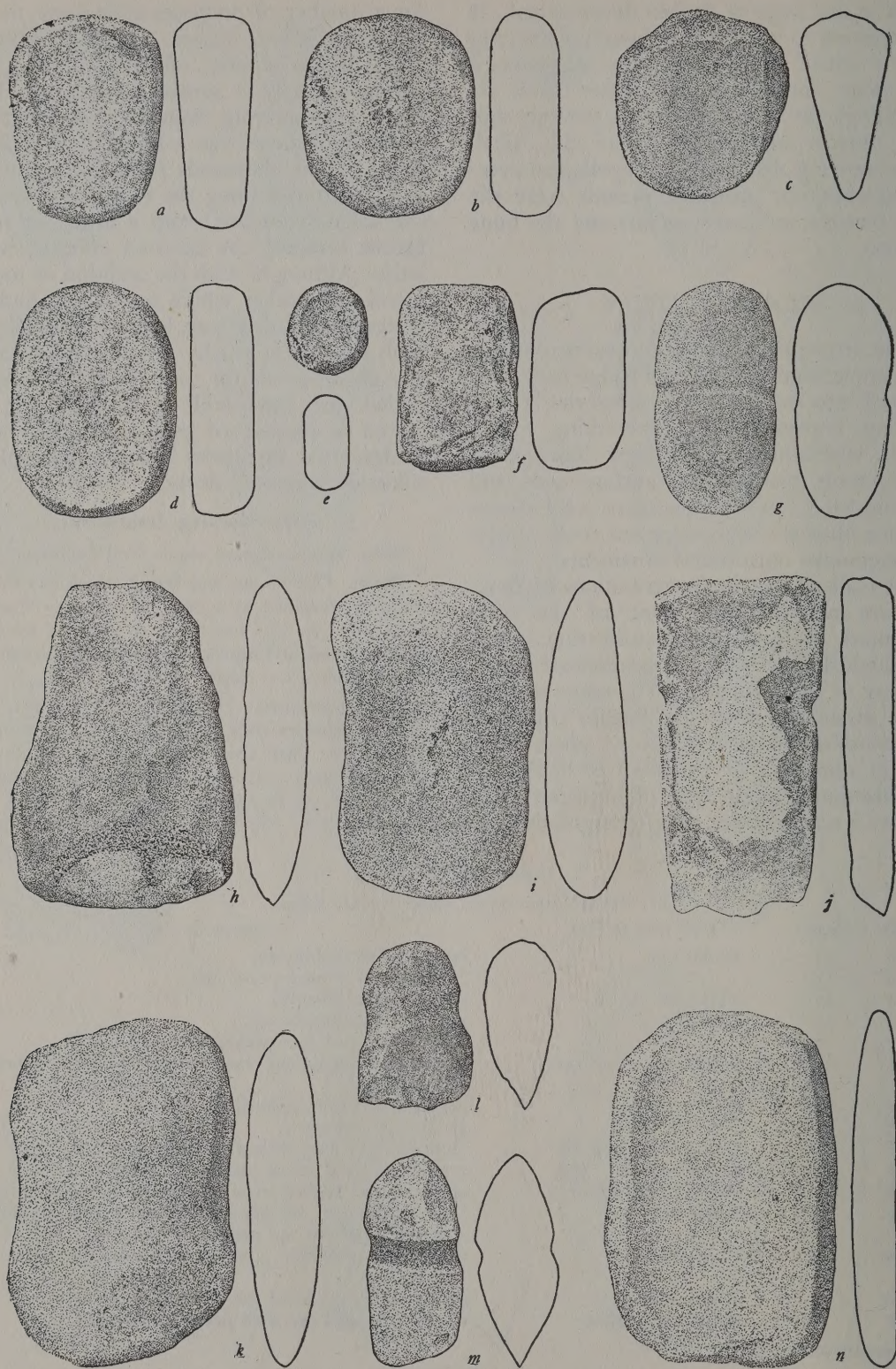


FIGURE 49

pressions, presumably to supply a hand-grip, in opposite faces. I can not give the number of hammerstones found. This was one of the failures in our Alkali Ridge technique.

Mauls. Twelve mauls of igneous rock and sandstone were found. They were of 3 types: three were notched (figs. 47, *b*; 50, *f*); eight were continuous or full grooved (figs. 49, *g*; 50, *e*, *g*, *b*; 51, *d*, *f-b*, *m*); and one was intermediate in type (fig. 50, *f*), with a crude sort of $\frac{3}{4}$ groove. The notched mauls came from Pueblo III and late Pueblo II sites. Full-grooved specimens were found throughout. One object listed as a maul (fig. 51, *b*) shows little if any evidence of pounding. It also has a very small groove. It may have been a weightstone.

Polishing Stones. River pebbles, "polishing pebbles," of various sizes and shapes were found at all sites. They are included in the functional classification in various places. Their appearance under stone-working tools arises from the belief that some of them were used for finishing other stone tools, by grinding and smoothing. The amount of wear on some of the pebbles suggests this. They were used extensively also for polishing pottery.

Axes. Although the main listing for axes is under wood-working tools, it seems proper to give them a secondary position here. Many of the implements classified as axes were too blunt, in their final form, at least, to have served as such. They were probably used extensively for breaking and trimming building stones. See Kidder, 1932, p. 53; Morris, 1939, p. 137; Reed, 1943.

Wood-working Implements

Adzes and axes.

Adzes. Two implements were found which seem definitely to have been adzes (figs. 47, *b*; 48, *b*). These were stone implement heads, beveled on 1 face (the inner face) and grooved for hafting. They were used, presumably, for trimming wooden beams, stakes, etc. They were shaped initially by chipping, then the faces and grooves were pecked into proper form. Parts of the faces were, in addition, ground smooth. Figure 47, *b* was from a Pueblo II level; 48, *b* from Pueblo I.

Four other stone implements may have been adzes: they are listed as "axe or adze" (figs. 47, *m*; 51, *b*) and "hoe or adze" (figs. 48, *m*; 49, *b*), all from Pueblo I levels in Site 13.

The materials from which these tools were made are gray chalcedony, igneous rock, and gray conglomerate; 48, *m* and 51, *b* are shaped from river pebbles. The only one with a full groove is figure 48, *b*, from a Pueblo I room at Site 13. Two of the others, figures 47, *b* and *m*, present a situation common also in the axes of the San Juan; grooves on 3 sides with none on the fourth. This would permit a classification of $\frac{3}{4}$ groove for these specimens, but I do not believe it would be a justifiable procedure to label them as such. The absence of groove seems to be fortuitous and, if the 2 characteristics can be combined, functional. The absence occurs only where the contour of the stone is such that the continuation of the groove would not be necessary, functionally, for hafting. Furthermore, sometimes it is a face and sometimes a side on which the groove is missing. So, on the whole, I do not believe that we can derive the later $\frac{3}{4}$ -grooved axe from these crude variations of early San Juan stone-working techniques.

Axes. With a few exceptions the stone axes were relatively crudely made when compared with those

LEGEND FOR FIGURE 49

STONE IMPLEMENTS FROM ALKALI RIDGE

No.	SITE	LOCATION IN SITE	SPECIMEN
<i>a</i>	13	Pit House B, floor	pecked rubbing-stone or small mano
<i>b</i>	13	Pueblo I Phase	" " " " " "
<i>c</i>	5	refuse mound	rubbing- or grinding-stone
<i>d</i>	13	Room 218	pecked rubbing-stone or small mano
<i>e</i>	13	Unit 2, kiva, below bench	pecked "scouring stone"
<i>f</i>	2	post house, 18 centimeters below surface	chipped and pecked stone, probably a hammer; 3 slight notches for hafting
<i>g</i> *	13	Room 297	grooved maul
<i>h</i>	13	Pueblo I Phase	hoe or large adze; pecked and chipped
<i>i</i>	13	" " "	mano with finger grip
<i>j</i>	13	Room 294	notched axe or hoe; chipped, pecked, and ground from sandstone slab
<i>k</i>	13	Pueblo I Phase	mano with thumb and finger grips
<i>l</i>	1	Unit 1, refuse mound	ground-stone axe; pecked partial groove
<i>m</i>	11	kiva bench	pecked full-grooved axe; ground face
<i>n</i>	13	Pueblo I Phase	mano

* Length of *g*: 12.1 cm.

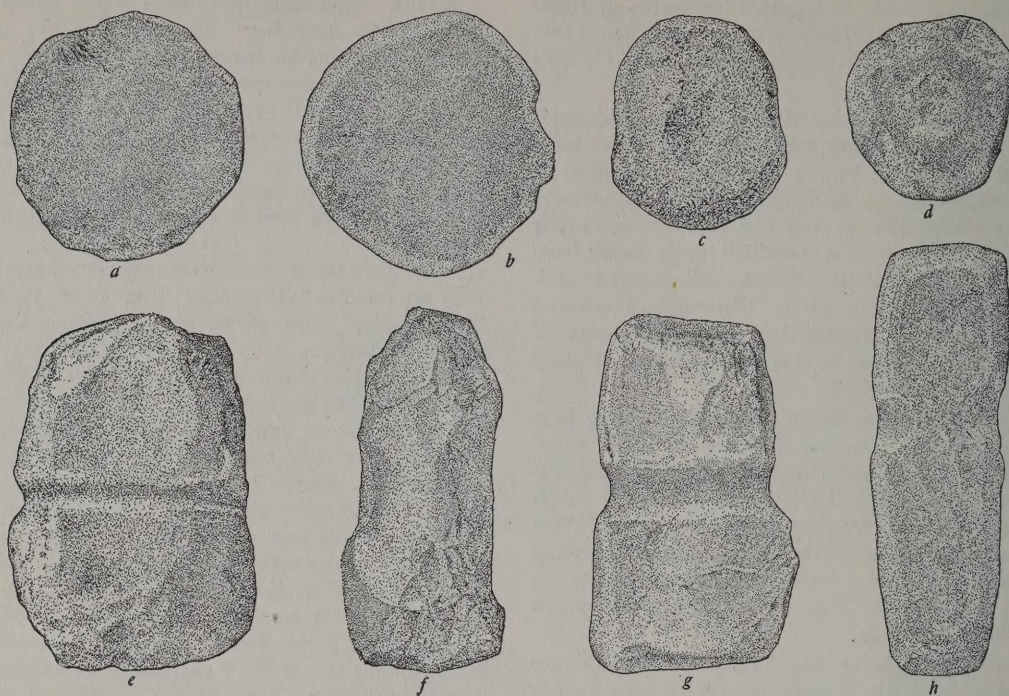


FIG. 50



FIG. 51

FIGURES 50 AND 51

of many other parts of the Southwest. This conforms to San Juan tradition. Most, but not all, of the careful workmanship was in the Pueblo III period. In all 36 stone implements were classified as axes, axes or adzes, axes or hammers, etc. Many were made from river pebbles. The materials utilized were igneous rock, conglomerate, quartzitic and silicified sandstone. Igneous rock was by far the most common. They have been placed in 3 types with regard to the preparations made for hafting: 22 notched, 4 partially grooved, 10 full grooved. All types were found in all periods. However, a trend may be observed in our findings. Notching was the most popular technique in Pueblo I times, with the full groove used least. In Pueblo III, the full groove is dominant. The follow-

ing table shows the distribution by Pecos Classification periods:

TABLE 7. Stone axes from Alkali Ridge sites.

Level	Notched Axes	Partially Grooved Axes	Full Grooved Axes
Pueblo I	10	2	1
Pueblo II	8	1	4
Pueblo III	3	1	5
Surface	1	..	..
Totals	22	4	10

Only 2 axes, both of the notched type, were double-bitted (figs. 47, *i*, *o*), and neither of

LEGEND FOR FIGURES 50 AND 51

(The scale of fig. 51 is half that of fig. 50.)

STONE OBJECTS FROM ALKALI RIDGE

PROVENANCE

FIG. NO. SITE LOCATION IN SITE

50, <i>a</i>	13	Room 124
<i>b</i>	13	" 109
<i>c</i>	13	Unit 1, kiva
<i>d</i>	?	② kiva fill
<i>e</i>	13	Unit 3, kiva, fill
<i>f</i> *	13	Room 81
<i>g</i>	13	Pit House F, floor
<i>h</i>	13	Pit House B

* Length of *f*, 17.4 cm.

51, <i>a</i> **	11	post houses, west end
<i>b</i>	13	Room 117
<i>c</i>	7	" B, stuck in wall
<i>d</i>	13	Pit House H, S. antechamber
<i>e</i>	1	Unit 1, kiva, at south (back) end of horizontal ventilator shaft
<i>f</i>	1	Unit 1, refuse mound
<i>g</i>	13	Pueblo I Phase
<i>h</i>	5	Kiva 2, top fill

<i>i</i>	-	Black's Spring, surface
<i>j</i>	5	House T, bottom of cist C
<i>k</i>	13	Pueblo I Phase
<i>l</i>	13	Unit 1, kiva, bench
<i>m</i>	13	Room 214A
<i>n</i>	5	refuse mound
<i>o</i>	3	refuse mound, Burial 1
<i>p</i>	13	Pueblo I Phase
<i>q</i>	5	House T, bottom of cist C

** Length of *a*, 22.3 cm.

SPECIMEN

sandstone disc; edges chipped and ground
sandstone disc; edges chipped and ground
pitted hammerstone
" "
chipped and crudely pecked grooved maul
chipped notched maul
chipped, pecked, and ground grooved maul
pecked and ground grooved maul
axe; chipped, pecked, and polished; carefully pecked notches connected by crudely chipped groove
river-pebble axe or adze; chipped and pecked notches; edge ground
pick of laminated sandstone (the material of which tchamahias are usually made); pecked notches at 4 corners; edge ground and polished
large maul; pecked groove
axe; partly polished, pecked full groove
maul; pecked groove
axe; pecked full groove; poll maul
sandstone object; narrow, irregular, pecked full groove; very little evidence of pounding, and that on one end only; may have been a weightstone
hoe; chipped notches
mano; single face; finger and thumb-grips; conglomerate
mano; single face; single grip; sandstone
"tiponi"; sandstone, carefully pecked
grooved maul; carefully pecked
mano; biface; triangular cross section; double grip; basalt
mano; biface, triangular cross section; sandstone
mano; biface; rectangular cross section; sandstone
mano; single face; sandstone

these is a very good specimen technically speaking. The other axes were of the bit-and-poll type, some with definite hammer-polls such as figures 47, *g, j*; 51, *g*.

The distribution of the illustrated axes by type and period is as follows. Notched axes: Pueblo I, figures 47, *l, o*; 48, *a, d, e, l, o*; 49, *j*; 51, *b*; Pueblo II, 47, *a, f, i, k*; 48, *f, j*; Pueblo III, 48, *n*. Partially grooved axes: Pueblo I, 47, *e, m*; Pueblo II, 47, *d*; Pueblo III, 49, *l*. Grooved axes: Pueblo I, 51, *g* (also note full-grooved adze from Pueblo I, fig. 48, *b*); Pueblo II, 47, *g*; 48, *k*; 49, *m*; 51, *a*; Pueblo III, 47, *c, j, n*; 48, *i*; 51, *e*.

Whetstone

Only 1 stone can be placed in this category with confidence (fig. 48, *b*). It is a form which has often previously been lumped with "arrowshaft polishers or straighteners," but from the marks on it and the V-shape of the groove I believe it to have been a sharpening-stone. We found it in the refuse mound at Pueblo II Site 3.

Agricultural Implements

Hoe blades.

Four large, flat, notched implements were found which might be called hoe blades. One was made from a flat river pebble, shaped at the edge of 1 face only, by flaking and grinding (fig. 48, *m*). This came from a Pueblo I storeroom at Site 13. Three were made of hard sandstone, shaped by flaking, or by flaking and grinding (figs. 49, *b, j*; 51, *i*). One came from Pueblo I, one from Pueblo II, and one from the mesa-top near Black's Spring.

Milling Tools

Querns (metates), hand stones (manos), and mortars (?). No pestles were found.

Metates. All metates found on Alkali Ridge were made of sandstone, of different degrees of hardness. They varied in degree of roughness presumably for coarse, ordinary, and fine grinding. Two gross types have been made according to the shape of the grinding surface and its relation to the whole stone. These are: plain surface, called "flat," actually slightly concave, in which the grinding surface is the entire top of the stone; and troughed surface, in which the grinding surface is a groove in the top of the stone. The former type is that found in the meal bins at Site 12 and is common in meal bins elsewhere¹⁴ and has been found on Alkali Ridge only in Pueblo II and Pueblo III sites. The latter, which occurs in all periods, has been subdivided into 2 types on the

basis of the shape and finish of the remainder of the stone apart from the groove. Descriptions and the significance of these 2 subtypes have been presented earlier in this section (pp. 231-35). Photographs of Alkali Ridge metates are shown in figure 174.

Metates were shaped roughly by fracturing. In the case of Pueblo II and Pueblo III metates this was followed by pecking. The groove was probably started by pecking. Then, when the grinding surface became too smooth to be properly effective, it was pecked to the desired roughness again. Thus, the groove became deeper and deeper until it wore through the stone or came so close to doing so that the metate was no longer used for grinding purposes. When that point was reached, it often appeared in the masonry or as a deflector slab, as in Pit House G (fig. 96, *d*).

Manos. A large number of manos were found, 189 from the Pueblo I Phase of Site 13, alone. They were made of various types of sandstone and of igneous rock. They have been divided into 2 types with 3 and 4 subtypes respectively, as follows:

Type I, single grinding surface.

A. Flat.

B. Convex from side to side.

C. Convex from end to end.

Type II, 2 grinding surfaces, 1 on each face.

A. Both grinding surfaces flat.

B. One flat, 1 convex from end to end.

C. Both convex from end to end.

D. Both sloping toward a common edge so that the mano is wedge-shaped in cross section (fig. 51, *o*).

All types and subtypes were found in all periods. The only chronological differences which seem to be significant are that the manos from Pueblo I have a decided tendency to be shorter, absolutely, and wider, relatively, than those from later sites and that a higher percentage of manos with grinding surfaces convex from end to end occurs in Pueblo I sites.

Mortars (?). Two stone dishes or bowls, which may have served as mortars, were found, one of hard sandstone, the other of igneous rock. The latter was small, had an oval groove, and came from the refuse mound at Pueblo II Site 12 (fig. 48, *g*). The former was found, containing beans, on the floor of the kiva at Pueblo III Unit 1, Site 1 (figs. 85, *a*; 175, *j*).

Piercing and Cutting Tools

Projectile points, knives, drills, and saws.

Chipped-stone artifacts were rarely found in the Alkali Ridge sites. All unbroken specimens of points and knives and those of which enough remained to give fairly certain indications of size and shape are illustrated in figures 170 and 172. They were made of chert, red agatized rock, and white quartzite. The

¹⁴ Morris, 1939, plate 57; Bartlett, 1933.

significance of the distribution of arrow-points in the sites has been discussed earlier in this section (p. 233). I shall make no attempt to distinguish between knives and spear-points. Because of its asymmetry, however, we can probably conclude that the object shown in figure 170, *m* was a knife. The only object which could be satisfactorily classed as a drill was that shown in figure 172, *s*. An interesting group of specimens with serrated edges was obtained, mostly from a jar in the jacal house at Pueblo II Site 12. These are shown in figure 171 where it will be noticed that most of them are flakes retouched only where the serrations occur. Experimentation demonstrated that many of these were effective saws.

All of the piercing and cutting instruments show secondary chipping, presumably by pressure flaking, in varying extent and varying degrees of fineness.

Scrapers

End-scrapers, side-scrapers, and 1 combination end- and side-scraper.

Only 10 scrapers were found on Alkali Ridge, 6 end-scrapers, 3 side-scrapers, and 1 with retouched edges on 1 side and 1 end. Nine of these were made of chert and 1 of agatized rock. They were all shaped by primary and secondary chipping (fig. 170).

Ornaments (?)

Pendants, etc. (fig. 173).

This is a very indefinite and unsatisfactory classification. It is designed to accommodate a series of limestone objects, some of which are perforated. Many of them show marks or scratches, however, which give rise to the belief that they may have been tools of some sort and not ornaments. The mere fact of perforation does not necessarily indicate that an object was an ornament. Five of these objects are perforated (fig. 173, *a, b, d, e, g*), one appears to have been perforated at one time (fig. 173, *c*), and two are partly pierced (fig. 173, *f, h*). The others are merely flat pieces of similar material. They have been shaped by grinding and polishing.

Ceremonial Object

A large sandstone object (fig. 51, *l*), weighing 22 pounds, 8 ounces, was found on the bench of the kiva at Unit 1, Site 13. It is 21.5 centimeters high, carefully pecked into a beautifully rounded shape with flat bottom. The cross section is greatest at the base and slightly oval, the co-ordinate diameters measuring 17 by 19 centimeters. There is a very good likelihood that it was a ceremonial object. Again I stress the point that we must not bend over backward in our caution against the term "ceremonial object" particu-

larly when, as in this case, we are dealing with a find in a ceremonial building.

In size and shape the stone is similar to the objects called "Tiponis" by Roberts.¹⁵ They are of common occurrence in Pueblo sites. The Zuni Indians working for Roberts said they resembled the "corn goddess symbols" in use in the kivas today, and demonstrated the position they thought the stones should occupy in the kiva. An article on "Tiponis" has recently been published by Lange.¹⁶

Miscellaneous

A number of miscellaneous stone objects were found at the Alkali Ridge sites. These included approximately round, flat sandstone discs, 10 to 30 centimeters in diameter, which may be classified as pot covers (fig. 50, *a, b*); and medium-sized flat sandstone slabs, too small for door-slabs, but large enough to be placed in Morris' classification of "lapstones."¹⁷ I take it that this classification implies that the slabs may have been small work-benches held in the lap.

A splendid example of the *tchamahia* was found at Site 11, in the debris of the western section of the Pueblo II jacal house. It is an elongated celt-like object made of fine-grained laminated rock, very highly polished, 25 centimeters long, 7.6 centimeters in maximum width, and 1.75 centimeters in greatest thickness (fig. 175, *k*). Similar objects are now used for ceremonial purposes in Pueblo kivas.¹⁸ There has been considerable speculation as to the use of these in archaeological sites, where they are very common, in the San Juan. Some have called them hoes, others skinning knives, and others have been satisfied with the term, *tchamahia*. Morris has made a special study of these objects in the San Juan, and he presents an extensive discussion of them in his *La Plata* report.¹⁹ With regard to form, the objects usually called *tchamahias* can be placed in 3 categories: elongated celt-forms, notched, and shouldered. The shouldered form usually has a proportionally wide blade. The last 2 types, from their forms, certainly suggest use as hoes. Perhaps they were all so used, or perhaps we are dealing, here, with 2 separate implements, a hoe and a "skinning knife." Most of the archaeological specimens show so much evidence of use, in flaking along the edge of the bit, that it is not generally believed that they were ceremonial objects during Pueblo II and Pueblo III times in the San Juan. It is possible that these represent an ordinary tool or tools which have been superseded in function by other forms but which have continued in the culture as ceremonial objects. It is also possible that modern ceremonial usage may not go back continuously to the archaeological forms, but that it may derive from

¹⁵ Roberts, 1932, p. 61, plate 10, *b*.

¹⁶ Lange, 1944.

¹⁷ Morris, 1939, p. 131, plate 143.

¹⁸ Parsons, 1939.

¹⁹ Morris, 1939, pp. 138-40 and plates 166-71.

the discovery of these implements, which are often quite beautiful, in ancient sites. Fine examples of ancient stonework are often considered to have special "powers" and find their way into "medicine bundles." This may be another example of that process.

A stone of the kind classified by Kidder,²⁰ following Jeançon,²¹ as "floor-polishers" was found on the bench in the southeast recess of the kiva at Unit 1, Site 1 (fig. 175, *n*). It is 25.5 centimeters long, 19.2 centimeters wide, and 4 centimeters thick. It weighs 5 pounds, 12 ounces. Kidder characterizes the identification as "more or less guesswork . . . probably used

for smoothing wall or floor plaster." A smaller stone which might be placed in the same class is figure 175, *m*, from the bench of Kiva I, Site 12.

One other kind of flat stone which may perhaps be classified was found in the Pueblo II and Pueblo III sites. This is the form which resembles a large mano, but which shows no evidence of having been used for grinding. Stones of this kind are classified by Morris as "Sandle Forms." He suggests that they served as lasts during the manufacture of the jog-toed sandal of the San Juan.²² He quotes Kidder and Guernsey as having originally advanced this theory on the basis of finds in northern Arizona.²³

BONE OBJECTS

From a classificatory point of view the most significant bone implements found on Alkali Ridge were the end-scrapers or "fleshers." One type was found in the Basket Maker III-Pueblo I Phase²⁴ of Site 13, another type in the Pueblo II sites. The earlier ones (figs. 185; 186, *a*) were made from fragments of shafts of long-bones, "splinters," etc., were functional at both ends and were quite variable in size and shape. The later ones were made from humeri of deer and antelope and were functional at one end only, with the original condyle left but slightly smoothed down at the other end to serve as a hand-grip (fig. 186, *b-d*). All of the fleshers found in the Pueblo I levels were of the first type; all in the Pueblo II levels were of the second type. There was no overlap.

Morris found scrapers made from humeri in only Pueblo III sites in the La Plata region.²⁵ All 3 scrapers of this type found on Alkali Ridge came from Pueblo II sites, however. Martin, in his Basket Maker III-Pueblo I sites in the Ackmen-Lowry region, found only the shaft-type scrapers without condyle. On the basis of present evidence, then, it would seem that the new fashion of end-scrapers came to the Four Corners country of the San Juan at about the time our label changes to Pueblo II, that is, around 900 A.D. in the present tree-ring chronology of the region.

"Period" differences in the remainder of the bone objects, as in most of the stone implements, are matters of percentage occurrences,

except in the case of certain forms which were found too rarely to permit us to list them as specific developmental variations.

BONE MATERIALS USED

Both mammal and bird bones were utilized on Alkali Ridge in the manufacture of bone objects. Because in so many cases only part of the shaft of a bone was used, it is often impossible to identify the kind of animal from which the bone came. Insofar as identifications were possible the following conclusions were reached. Deer bones, particularly metapodials, seem to have been used most frequently. From them were made awls, awl-spatulas, end-scrapers, weaving or matting tools, polishing tools, and ornaments. Other animal bones used were tibiae of the rabbit, leg bones of the mountain lion, and ulnae and humeri of the antelope for awls and/or daggers; and leg bones of the lynx for tubular beads. Bird bones, metatarsi and femurs, were used for awls and tubular beads.

TECHNOLOGY

Some indications were obtained as to the processes by which bone artifacts were made. Other deductions may be made on the basis of tools found at the sites. Long-bones were split longitudinally and sawed longitudinally and transversely. Many fragmentary pieces of bones found bore witness to this and some pieces were discovered partially sawn through.

²⁰ Kidder, 1932, pp. 64-65 and fig. 41.

²¹ Jeançon, 1923, p. 21.

²² Morris, 1939, pp. 131-32, plate 144.

²³ Kidder and Guernsey, 1919, pp. 105-06.

²⁴ See footnote 6, p. 233.

²⁵ Morris, 1939, p. 122.

The sawing was probably done by means of chalcedony flakes perhaps like those shown in figure 171. The pieces so obtained were then probably ground to the desired shape on sandstone or other abrasive rocks and then polished with leather or some fibrous material. The "gaming pieces" (fig. 188, *a-d*, *f-i*) had incised patterns, again probably done with chalcedony flakes.

CLASSIFICATION

The bone artifacts will be placed in functional classes, as were those of stone. Difficulties arising from our lack of knowledge are even greater here than in the case of stone objects. For the most part, the attributions of function suggested by Kidder will be used,²⁶ but it must be realized by the reader that such assignments of function as "weaving tools," "bead-polishing tools," and "gaming pieces" are based on very little good evidence. However, we know from finds in the dry caves that the people who occupied the San Juan during the centuries covered by the Alkali Ridge sites had woven cloth and mats and we may assume that they played games.

The categories into which the bone objects will be placed are: perforating tools, loom-weaving tools, mat- and basket-weaving tools, hide-working tools, bead-working tools, ornaments, and sporting pieces. The total number of bone objects found was 101.

Perforating Tools

Awls. Number found, 66.

The awls have been classified according to the system used by A. V. Kidder for the bone awls found at Pecos.²⁷ His system has 5 classes depending upon the amount of alteration of the original bones from which the implements were made. The classes are:

- a) Head (condyle) of bone unaltered.
- b) Head unaltered except by splitting. This usually applies to deer and antelope metatarsi.
- c) Head partly worked down.
- d) Head wholly removed.
- e) Bone splinter, that is, fragment of bone not including the condyle on either end.

Class a awls. Ten found: length 9.3 to 15.5 centimeters, figure 176; bones used: tibia of rabbit (2), radius and ulna of mountain lion, ulna of deer, ulna of antelope (2), tarso-metatarsus of turkey, femur of

turkey (2). Two came from Pueblo I levels of Site 13, 6 from Pueblo II sites, and 2 from Pueblo III.

Class b awls. Twenty-four found: length 6.3 to 23.0 centimeters, figure 177; all made from deer metapodials; distribution: 20 from Pueblo I, 3 from Pueblo II, 1 from Pueblo III.

Three awls of this group, 2 from Pueblo I and 1 from Pueblo II, possessed particularly thin and sharp points. These had been made, probably, by grinding the tips especially, producing an abrupt shoulder above the point. It is possible, however, that the reduced point may have been worn thin by use.

Class c awls. Thirteen found: length 6.4 to 21.5 centimeters, figure 178 (except *g*, *k*, *l*, which are class a); 12 made from deer metapodials, 1 from the leg bone of a bird; distribution: 9 from Pueblo I, 4 from Pueblo II. The heads of these awls were partly worked down.

Class d awls. Six found: length 7.0 to 17.2 centimeters, figure 180; all made from deer metapodials; distribution: 4 from Pueblo I and 2 from Pueblo II. The butts of these awls, from which have been ground off all of the protuberances of the condyles, may be rounded as in figure 180, *d* or squared off as in figures 180, *b* and 184, *a*. Two of the awls of this type (fig. 180, *a*, *e*) have been pierced, perhaps for suspension or so that the implements could be used as needles.

Class e awls. Thirteen found: length 4.4 to 14.2 centimeters, figure 181; awls made from splinters; those which can be identified are from the metapodials of deer; distribution: 6 from Pueblo I and 6 from Pueblo II. In these awls the ends were sometimes shaped, either rounded or squared off, and sometimes left in the form in which they were splintered from the original bones.

Weaving Tools

Loom-weaving and mat- and basket-weaving. Nine found: length 5.7 to 14.2 centimeters, figures 176, *d*; 183, *a*, *d*; 184; 185, *f*; bones used, mammal leg bones, mostly deer metapodials, 1 mountain lion tibia; distribution: 7 from Pueblo I and 2 from Pueblo II. The instruments are placed in this category because of marks upon the bones. There is an overlap in the classification here, some of these being listed under awls, above. Included in the group are 5 awl-spatulas (fig. 184) sharpened to a point at 1 end and beveled on 1 face at the other end. The spatula ends are slightly rounded or squared off. The other 4 specimens in this group are awls or spatula-like implements with transverse grooves on the shaft (fig. 176, *d*) or vertical grooves at the end (fig. 185, *f*), produced by wear, possibly in weaving.²⁸ Ordinary awls were probably used for guiding the weft in weaving.

²⁶ Kidder, 1932, pp. 195-271.

²⁷ Kidder, 1932, p. 211, figs. 173-77.

²⁸ See Kidder, 1932, pp. 225-27 and fig. 190.

Hide-working Tools

End-scrapers or "fleshers." Thirteen found: length 6.8 to 16.4 centimeters, figures 185, 186; bones used, humerus of deer and antelope, and sections of long-bones. Two types were found, as described earlier in this section, 1 with the condyle unaltered and 1 with the head ground off. Distribution: 3 specimens, humeri, with heads intact from Pueblo II; 10 with heads ground off, all from Pueblo I. In cases where the head was left intact it was always the curving condyle on the distal end of the bone which remained. In the cases where the condyles had been removed, both ends had been beveled on 9 of the specimens, while on the tenth 1 end only had been beveled, the other having been squared off. In the double-ended type 1 end was sometimes more pointed than the other (fig. 185, *b, d, f, g, h*). It is generally thought that these instruments were used in scraping hides. It seems to me that much of the scraping of the hides of large animals, at least, would have been done with stronger implements, such as the much-disputed tchamahias. In working the leather after it had been cleaned, ordinary bone awls were probably used extensively.

Bead-working Tools

Only 1 specimen was placed in this category: length 8.3 centimeters, figure 183, *c*; from long-bone of a deer; found in Pueblo I. One end is beveled on 1 face. The other end is rectangular in cross section and concave, as shown in the photograph. The groove made by the concavity is highly polished, and it is thought that this end may have been used for polishing bone tubes for beads. This, of course, is entirely hypothetical.

Ornaments

Bone tubes. Six found: length 3.5 to 9 centimeters, figure 187; 4 from long-bones of turkey, 2 from long-bones of wildcat; distribution: 5 from Pueblo II and 1 from Pueblo I. Bone tubes present an interesting problem in classification. One question is whether a bone tube has been a bead, another kind of ornament, or some sort of implement. The bone breast plates worn by many modern tribes, including the Utes who at present inhabit part of the San Juan, are a case in point. On the other hand, there are numerous examples in modern Indian fashions of very long

bone tubes appearing in necklaces. Furthermore, there have been many archaeological finds of the longer tubes in such association with large numbers of small beads as to justify classifying them as beads. Even the presence or absence of a high polish does not provide a satisfactory diagnostic. The functional classification fails completely here, and we must fall back upon the classification by material and form, with the reservation that some of them, at least, were probably used as beads.

In all of the tubes from Alkali Ridge the shaft of the bone has been ground and polished. In every example but one the ends have been squared off, although in only one (fig. 187, *d*) has this been done smoothly. The fact that the ends have not been completely smoothed, however, does not necessarily indicate that they were not beads. One of the tubes, the longest, had only 1 end squared off (fig. 187, *f*). The other end still shows traces of the head of the bone.

Sporting Pieces

Eight found: length 2.2 to 2.4 centimeters, figure 188, *a-d, f-i*; bone used, unknown; all from Pueblo I Phase of Site 13. Seven of them are remarkably alike in size and shape. The variation in length is less than 2 millimeters; the variation in width is less than half a millimeter. One other object, classified with them because it is decorated in the same manner, is a pierced discoidal bone (fig. 188, *i*). All eight are very carefully ground and polished. They are decorated on 1 side only, with incised diagonals crossing each other to form a crude pattern of small diamonds. These objects are quite common in the Mesa Verde area. Roberts reports them from his Piedra sites;²⁹ Martin found them in the Ackmen-Lowry region;³⁰ and Morris has found them in the La Plata area, made of wood as well as of bone.³¹ They are variously called "gaming pieces," "bone dice," and "gambling pieces." Their chronological spread is Basket Maker III to Pueblo III, inclusive. The actual use to which they were put is unknown.

Miscellaneous Bone Objects

Four other bone objects were found in the Alkali Ridge sites (fig. 188, *j, k, l, m*). Their use is unknown. The wide, flat object with 2 notches along 1 edge (fig. 188, *k*) may have been a net gauge or a thread-winder.

ANTLER OBJECTS

Although many fragmentary pieces of antler were encountered during the excavation of sites of all periods on Alkali Ridge, only 4

whole or restorable objects of that material were found (fig. 189), all from Pueblo I levels³² in Site 13. The fragmentary pieces

²⁹ Roberts, 1930, p. 147, plate 43, *g*.

³⁰ Martin and Rinaldo, 1939, p. 420, fig. 120.

³¹ Morris, 1939, p. 123, plate 113, *d, e*.

³² See footnote 6, p. 233.

were so small that no useful evidence, beyond their presence in the sites, can be obtained from them. Of the 4 pieces illustrated, two (fig. 189, *b*, *c*) are blunt-ended sections of antler, worked at both ends; one (fig. 189, *a*) is a fragment at the fork between 2 prongs, with a hole in the center of the fork; and one (fig. 189, *d*) is a pointed fragment with a notch worn in 1 side near the point. Except for the notch, the last resembles 3 antler objects de-

scribed and illustrated by Morris.³³ Objects of this kind are usually called flakers and presumably were used in the pressure flaking of chipped-stone implements. The pierced forked piece is of the type generally known as an "arrowshaft wrench."

It is interesting to note, in connection with the small number of antler objects found, that Morris found only the 3 pieces mentioned above in all his work in the La Plata country.

SHELL OBJECTS

The only shell objects found were 4 beads of *Olivella* shell in Pueblo I levels at Site 13. *Olivella* is a Pacific Ocean shell. Shells from the Pacific are divided when possible into 2 groups, those from the Gulf of California and those from the coast proper. The division

could not be made in the Alkali Ridge shells. In *Olivellas* the distinction is based largely on color, and shells from archaeological sites are usually whitened to such an extent that Pacific Coast and Gulf of California *Olivellas* can not be satisfactorily distinguished.³⁴

ALKALI RIDGE CERAMICS

We habitually bemoan the small amount of archaeological work that has been done in various regions of the world and in various branches of the subject. I have done so, in this report, in connection with the small amount of stratigraphic excavation in the Mesa Verde area. Such complaints can not be made about the study of Southwestern pottery. Largely because potsherds are relatively indestructible, because they occur in such profusion in the sites of many Southwestern cultures, and because they are such sensitive indicators of time and place, pottery has been described and analyzed more than all of the other products of prehistoric Southwestern arts and crafts put together.

Yet I find this the most difficult section of the report to write. And I suspect the difficulty arises largely not, this time, from the lack of work but from the vast amount of it. There are so many different points of view about the archaeologically useful information contained in pottery, and these points of view are often antagonistic to each other. Certain things about pottery that some people appear to want to know seem to me quite useless.

Other things that some people want to know and which they seem to think they can learn from macroscopic examination of their own sherds can not be learned by macroscopic examination of sherds.³⁵

I have, however, an obligation with regard to the pottery known as Abajo Red-on-orange. At least 5 publications have announced, during the last 10 years, that I was going to describe Abajo Red-on-orange. So I shall describe it, attempting to provide all the information that seems to be desired on the basis of published reports of Southwestern pottery.

The scheme of the ceramic section of the report is as follows. First, there will be a concise statement of the development of pottery on Alkali Ridge for the general reader. Second, there will be a short report by Miss Anna O. Shepard of her spectrographic analysis of the red painted pottery from Site 13, for the benefit of those who wish to know what it is really made of. Third, there will be a section for Southwestern ceramic taxonomists with a description of a "new type," Abajo Red-on-orange, and finally there will be a short discussion of the material illustrated, with refer-

³³ Morris, 1939, p. 123, pl. 113, *a-c*.

³⁴ See the extensive discussion of this difficulty in Tower, 1945, pp. 3-5.

³⁵ Demonstration of the truth of this statement will be found in Shepard, 1936, p. 406.

ences to the plates and to the work of others, for Southwestern archaeologists in general.

The pottery is fully illustrated. All significant whole and restorable pieces are shown and a large number of sherds, as well. The extensive captions of the collotype plates at the rear should be read along with the text. Certain features are described in them alone.

I realize that it is impossible to present everything that students of the future, or even of the present, will want to know about this pottery. The student making a really intensive study must go to the material, anyway. Every potsherd uncovered by the Southeastern Utah Expedition was sent back to the Peabody Museum. With the exception of duplicate pieces sent as type collections or in exchange to other institutions all of this material is catalogued in the Peabody Museum and will continue there, available to all qualified students for study.

The great amount of broken pottery found on and in Pueblo sites is a continuous source of amazement to visitors, particularly to archaeologists from other fields in the United States where at times a potsherd may be equivalent to

treasure trove. During the height of the Awatovi Expedition in the Hopi country, sherds were passing over the classification tables at the rate of more than a quarter of a million a season, from the excavations alone. It is to be hoped that eventually some method, statistical or otherwise, will be devised for obtaining estimates in which we can place some confidence of the use of pottery vessels in prehistoric sites. In a search for comparative material I encountered figures for broken dishes (crookery, china, glass) in a Canadian hospital during September, 1937. The total was 1,238 of which slightly over half was for three items: tea cups, 290; tumblers, 230; dinner plates, 126. During the month the hospital population was: staff, 333; patients, 288; a total of 621, almost exactly 2 breakages per month per person. The number of meals served during this time was 45,573; that is, 36.8 meals before one piece was broken. A cup lasted for 157 meals which means it was washed at least 156 times. The pottery used and the manner of use at the hospital differ greatly from Alkali Ridge. However, similar and fuller statistics from a modern "primitive" group using more comparable earthenware would form a good basis for estimates.

GENERAL STATEMENT: ALKALI RIDGE POTTERY

We had a talk, one day at the club, of a highly scientific nature. Such a talk may be interesting, and certainly instructive, if there is only one scientist talking. He has to make himself clear to the rest. But on this day there were two of them. That may appear to have made it twice as interesting: as a matter of fact it was the dullest talk I have heard in the club for a long time. You see, they each knew what the other was talking about, so that there was no necessity to make themselves any clearer. — DUNSANY

The earliest pottery found on Alkali Ridge is that known as Basket Maker III ware;³⁶ unpainted vessels of plain gray and vessels made with a finer paste of lighter gray decorated with designs in black paint. In most early ceramic industries the color runs to buffs, browns, and reds. In much of the southwestern Plateau, however, the gray wares came first. It is generally believed that the Basket Maker pottery was baked in a smothered, or reducing, flame which produced black and gray colors in place of the reds and

browns usually found on early pottery and resulting from an open, oxidizing flame.³⁷ Only a few examples of typical Basket Maker painted pottery were found on Alkali Ridge,³⁸ a very small fraction of 1% of the painted wares in that phase of Site 13 which we are calling Pueblo I. Whether or not sites bearing this as the predominant painted ware exist in the immediate vicinity is unknown. Our surface surveys on Alkali Ridge produced none. On the other hand, the plain Basket Maker III gray ware was the standard un-

³⁶ Taxonomic terms will be found in the section, "The Taxonomy of Alkali Ridge Ceramics," to follow.

³⁷ For a thorough discussion of this point, with records of firing tests, see Shepard, 1939, pp. 261-67.

³⁸ See figs. 52, 5, *t*; 103; 106; 107; 191, *g*.

painted pottery of the Pueblo I Phase of Site 13, more numerous by far than decorated pottery of any type.³⁹

The earliest ceramic industry of which we found extensive evidence on Alkali Ridge produced decorated ware with an orange ground color and designs in red paint. The orange was the color assumed by the clay under the conditions of the baking, without slip or other surface treatment. The decoration was made with an iron paint, applied before the pottery was baked. The paint usually fired red but there was considerable variation, resulting in a range through wine and plum colors to black. The colors are shown in the color plates, the standard red in figure 102, the range in the off-fired pieces in figure 101, *o-v*. Decoration was applied to the insides of bowls and to the outsides of jars and cups.⁴⁰ Very rarely crudely executed, apparently unplanned designs were found on the outsides of bowls. The best explanation of these seems to be that they were applied simply to test the brushes or the painter's facility in making certain designs. Only 1 example was found on a whole or restorable bowl (fig. 104, *b'*).

Table 9, page 262, lists the color variations of both the paint and the body of the pot. Note that the so-called orange ground color is usually a pink.

Occasionally gray areas appear in the field on decorated surfaces and, more commonly, on the unpainted exteriors of bowls. These are "firing clouds," imperfections arising from defects in the primitive kilns which produced reducing action at those spots. The exteriors of bowls were sometimes, though rarely, gray all over, while the interiors were of the standard orange color. This was entirely the result of the firing technique.

The outstanding feature of the orange ware, aside from the color, was the fact that many of the designs were identical with those found on the decorated baskets of the Basket Maker II, Basket Maker III, and Pueblo I periods.⁴¹

The occurrence of this red-on-orange pottery was the greatest surprise during the Alkali Ridge excavations. The Mesa Verde area

had been known as an almost exclusively "black-on-white" region; orange or red pottery was expected to appear only rarely as trade items.

Associated with the red-on-orange ware was an unpainted gray ware, taxonomically identical with the gray ware of the Basket Maker III period.⁴² The relationship between the 2 wares agreed with the distinction customarily, although somewhat unsatisfactorily, made in prehistoric Pueblo ceramics between "culinary" and "non-culinary" vessels.⁴³ The former, the gray ware, was dominant numerically.

Although most of the evidence of method of construction had been eliminated by careful smoothing of both exterior and interior surfaces, occasional indications led us to the conclusion that they were made by means of fillets of clay laid one upon another in encircling bands. Each band was a unit in itself, applied as a ring and pressed down to adhere to the one beneath. This is clearly shown by a new style in the unpainted gray ware which occurred rarely at Site 13. The banded fillets were left unsmoothed on the outer parts of the necks of some of the jars. This produced a corrugated effect known to southwestern archaeologists as "banded-neck."⁴⁴ The fillets were not arranged in a continuous spiral, however, as they were in the corrugated wares of later times on Alkali Ridge.

There were many differences other than color between the pottery of the pit houses and that found in later levels. Neither ladle nor dipper nor any sherd which could be assumed to have come from a ladle or dipper was found in the rooms or pit houses at the large Pueblo I village at Site 13. Ladling functions may still have been fulfilled entirely by split gourds, possibly augmented by small pottery bowls and by "re-used" potsherds. "Re-used" sherds are fragments of vessels which were put to secondary use. Of the pieces so used only those which were reworked (broken edges smoothed, etc.) can be identified. Many of these were found, some quite large (fig. 165). Many more pieces of broken pottery, both large and small, must

³⁹ See figs. 99, *a-b*, *j-o*, *t*, *w*, *kk*; 100.

⁴⁰ Drawings and photographs of other red-on-orange pieces will be found in figs. 52-66; 67, *m*; 99, *u*, *v*, *x-jj*; 104; 105; 108; 109; 110, *n-p*.

⁴¹ Figs 67; 175, *f*, *g*; 191, *e*, *h*.

⁴² Figs. 99, *a-b*, *j-o*, *t*, *w*, *kk*; 100.

⁴³ See footnote 49, p. 248.

⁴⁴ Figs. 99, *p-s*; 110, *d-f*, *b-k*.

have been used temporarily without being re-worked.

Another difference was in the shape of bowls. The early bowls were shallower as may be seen by comparing the side views of red-on-orange bowls in figure 99, *u*, *v*, *x*, *y* with those of Pueblo II black-on-white bowls in figure 111, *q-w*.

The most striking difference in the pitchers was of another kind, in surface treatment rather than in shape. Early pitchers were made of the plain gray ware; no red-on-orange pitchers were found. In Pueblo II and Pueblo III times, however, all pitchers found were of the painted wares.⁴⁵

The most important difference in terms of structure of the vessels was that no spiral coiled ware was found in association with the red-on-orange, only the foreshadowing of it in the rare "banded-neck."

It is not possible for us to date absolutely the red-on-orange ware and its associated gray ware. However, we have more evidence of date in this instance than for any of the other wares on Alkali Ridge. From this brief description of the pottery from the pit house phase of Site 13 the reader will readily understand our difficulties in making it fit into the Pecos Classification. The red-on-orange ware does not fit anywhere; the gray ware corresponds for the most part with one of the Basket Maker III diagnostics; and the associated architecture had many Basket Maker III diagnostic elements. On the other hand, "banded-neck" pottery is the prime diagnostic in the Pecos System for Pueblo I culinary ware, and standard Basket Maker III painted pottery was found in sufficiently small amounts to suggest that it was a survival, although it could, on the same grounds, be considered a trade ware. The rows of contiguous storage

chambers, again, did not appear in any of the Pueblo trait lists until the publication of Morris' La Plata report, 6 years after the completion of our field work. However, they certainly seemed to be a technological advance over the isolated circular and oval slab-lined storage pits listed for Basket Maker III.⁴⁶ And, following the customary practice in geology of dating a deposit by the latest fossils in it, the occurrence of "banded-necks," although very rare, would justify a Pueblo I label. So, somewhat tentatively, we began to substitute *early Pueblo I* for the appellation, *Basket Maker III-Pueblo I*, which we used throughout the field work. The results of the tree-ring studies, made by students of both the Douglass and the Gladwin schools, support this decision, with dendrochronological dates in the mid-eighth century, A.D.⁴⁷

Pueblo II pottery was characterized chiefly by the development of spiral coiling in the construction of vessels and by a return in the painted wares to black designs on light gray backgrounds, presumably baked in a reducing flame. The change in manufacturing technique was emphasized by the spread of the custom, first seen in the banded necks, of leaving the coils unsmoothed on the outside of part or all of the vessel. The coils themselves were usually ornamented by pinching with the fingers or nicking with some small tool as they were being laid on.⁴⁸ Decorative corrugation was to last 400 to 600 years in various parts of the Southwest, but apparently it was not adopted without a struggle with competitors. The banded necks of Pueblo I apparently began the tradition of structural decoration of the unpainted vessels, which are often called cooking pots in distinction from the painted pieces or "table" wares.⁴⁹ Even during the time of the banded necks, experimentation

⁴⁵ For early pitchers, see fig. 99, *o*, *w*, *kk*; for Pueblo II, fig. 111, *d-p*.

⁴⁶ Three pit houses (H, I, and K) have been classified as Basket Maker III and are believed to be the earliest at the site. However, even though two of them, at least (I and K, see fig. 27), lie underneath contiguous storage chambers; their final use was within the time of Abajo Red-on-orange pottery. The circular pits beneath and south of Room 201, also considered Basket Maker III, produced no distinctive occupation level. In other words, we found no isolated "true" Basket Maker III levels at Site 13.

⁴⁷ See pp. 89-91, and tables 3, 4.

⁴⁸ For Pueblo II corrugated wares, see figs. 148-63; 191, *f*.

⁴⁹ The customary division, by many Southwestern archaeologists, of Pueblo pottery into "culinary," "cooking," or "utility" wares on the one hand and "table" wares on the other is useful but perhaps reflects too closely our own use of crockery. As far as we know, the prehistoric Pueblos did not have tables, and in our own ceramics painted pottery certainly is not restricted to dinner services. Considering the present state of our knowledge of the uses to which these vessels were put, the simpler division of "painted" and "unpainted" wares seems to be preferable.

with other methods of decorating the gray jars was seen. Figure 191, *d* shows a fillet of clay added to the outside of a jar neck as a variation of the banded-neck technique. Figure 99, *n* shows a jar covered with knobs of clay applied to the outer surface, and figure 99, *ll* shows a unique painted decoration applied to a pot with the same paste composition as that of the unpainted gray wares. Even though the gray ware of Basket Maker III and Pueblo I was for the most part unpainted, it was often covered by a wash of red ochre after firing. This, of course, was impermanent, but traces of it are often found. It is called "Fugitive Red" and continues through Pueblo II and Pueblo III, when it was commonly applied to the otherwise undecorated exteriors of black-on-white bowls.

The experimentation with decorative techniques for unpainted wares was most active in the early part of the Pueblo II period.⁵⁰ These essays included designs in incised lines and punctate dots, sometimes on smoothed surfaces, at other times cut through the corrugations. Occasionally more than one of these variations were to be found on the same jar. Eventually, however, "all-over" corrugation prevailed and this continued through the Pueblo III period.

The new painted ware was similar to that which became popular, apparently early in the tenth century, throughout the San Juan. All whole or restorable specimens and examples of all design elements found are shown in the illustrations.⁵¹ From the style of the designs on this ware the specialized regional designs of Pueblo III in the Mesa Verde, Chaco Canyon, and Kayenta districts in large measure developed.

With the new wares we found deeper bowls, ladles, large wide-mouthed storage jars, and painted pitchers, none of which were found in the preceding period. The globular jars without necks in the gray ware and the squash-shaped jars had disappeared.

The transition from Pueblo II to Pueblo III was very gradual. The most important diag-

nostic of the new period was a change in the painted designs.⁵² The elements used were the same, but the arrangement and execution were different. The designs became more regular and heavier; that is, the proportion of painted to unpainted surface within the area covered by the design increased. On the other hand, the amount of the surface of pot covered by designs, for the most part, decreased. The new style of decoration usually was arranged in a narrow band directly below the rim on the interior of the bowl. As the decades passed bowl walls became thicker; the rim was flattened and painted, usually in a series of dots; designs began to appear on the outsides of bowls; carbon paint made from vegetable material began to supplant the popular mineral paints of Pueblo II; and the narrow band of design below the rims of bowls expanded again until in late Pueblo III times it once more customarily filled all or nearly all of the interiors. And throughout Pueblo III painted designs on the exterior of bowls, in addition to those on the interior, became increasingly popular.

The corrugations on the gray ware became much more regular. This ware, too, became thicker, the lips showed a greater tendency toward eversion, and a massive smoothed rim section supplanted the small Pueblo II rim fillet on the wide-mouthed jars.⁵³

The most striking new form was the "kiva jar," so called because so many have been found in kivas, a decorated globular jar without a neck, but with a cover. The cover rests on a flange specially made for that purpose around the opening.⁵⁴ Another new form was the famous Mesa Verde mug.⁵⁵

Along with these local wares have been found a few examples of imported pottery showing evidence, in designs and technology, of having originated somewhere in the direction of the spheres of artistic influence usually labeled Little Colorado and Kayenta.

Many of the unusual specimens ("aberrant types") found on Alkali Ridge do not seem to have been imports but rather to be the manifestations of local inventive genius and experi-

⁵⁰ Figs. 152, *f-i*; 153, *c, e, b*; 158-62.

⁵¹ Figs. 68, *a-c*; 69-73; 76, *a, g*; 111-14; 145-47; 151, *c, n, o, t*; 175, *c*.

⁵² Figs. 68, *d*; 74, *a-e*; 75; 76, *c-f'*, *b, i*; 77-80; 114, *k, k'*; 153, *a, b*; 191, *j*.

⁵³ For Pueblo III corrugation, see figs. 149, *m*; 153, *i*; 154, *b, j*.

⁵⁴ Figs. 76, *f, f'*; 114, *k, k'*; 191, *j*.

⁵⁵ Figs. 151, *u-u''*; 153, *a, b*; 168.

mentation. These were the ideas which failed, which never "took hold," and never became fashionable.⁵⁶

Most of the restorable pottery vessels found by the expedition came from houses and kivas. That a larger percentage of restorable pottery was not obtained in the refuse mounds seems, at first thought, surprising but is easily explained. Although all the sherds in a given mound were saved during excavation, all the sherds of a given pot rarely got into the mound in the first place. Let us reconstruct a scene at Site 1 during a bright autumn day. Two children are playing about on the roof and they dislodge a jar full of newly shelled corn which has been carelessly left too near the edge. It falls into the corner between the front and east rooms where the eldest brother is repairing a buckskin legging in the shade of the wall. The mother, aunts, brothers, and sisters come running to see what has happened. The corn is salvaged but the jar has been broken beyond repair. Instead of sweeping up the remnants the women paw them over, selecting likely sherds to replace worn-out pot-scrappers; to be made into scoops and spoons; to be rounded and pierced for spindle whorls. The jar had landed on its side and the heavy base is not broken. This is taken for a mould by one of the younger girls whose pot-making equip-

ment is still in that stage where she must be ever on the alert to improve it. Or it may be needed to serve as a plate in the house or kiva. The children try to get pieces out of which to make pendants, or paraphernalia for games, or earrings. One of the older women who is going to prepare a fresh batch of pottery clay tomorrow morning scoops up a double handful of pieces. These she will grind up and mix with the pot-clay to give it strength and keep it from cracking in the fire. Finally the pieces desired by no one are swept up and thrown on the refuse mound, a small proportion indeed of the actual number into which the vessel had been broken.

Certain it is that, although thousands of sherds appear in a refuse mound, very few pots are restorable from them. In accounting for this, besides the reason suggested above, erosion must be considered. Potsherds from the mounds are washed in great numbers down into the gullies and canyons. In fact, sites may often be located by following a trail of potsherds back up the washes.

Useful descriptions and discussions of various aspects of pottery-making will be found in Holmes, 1886; Guthe, 1925; Bunzel, 1929; Malcolm Rogers, 1936; Mary-Russell Colton, 1931; Tschopik, 1941; and Gifford, 1928.

MINERAL ANALYSIS OF ABAJO RED-ON-ORANGE POTTERY

It was found that the properties of clay and temper in the La Plata district are such that megascopic identification is difficult and frequently unreliable.

— SHEPARD

The mineral contents of the clays and pigments used in pottery-making have been demonstrated to be of archaeological value in the tracing of prehistoric trade and transport.⁵⁷ Unfortunately, in order to make evidence based upon mineral contents conclusive, a knowledge of the mineral resources of a large extent of country is usually necessary to a minuteness of detail which no geologist can supply or see any prospect of supplying. Information about the mineral composition of all clay beds, the spectrographic properties of all rocks existing in, let us say, a 25-mile

square, and similar information about the areas with which the original area is to be compared are essential to the conclusive operation of the system.

Like the other techniques we have borrowed from other sciences, this one is not absolute; it does not answer our questions for us. We must still weigh its results and then interpret them in terms of prehistory. Yet it is the most precise of all those analytical techniques of other fields which have been brought to bear upon our problems.

Even though its results can not be considered

⁵⁶ For example: figs. 99, *n*; 101, *w-cc*; 141, *d*; 151, *i*, *p*; 191, *d*.

⁵⁷ Shepard, 1936, 1939.

absolute because of the lack of the complete geological and mineralogical information it demands, it still produces evidence which may be very useful. When a mineral or rock, known to be common in one ridge of mountains and not known to occur anywhere else in the expected range of prehistoric trade, is found in a series of potsherds from a region well removed from those mountains, it will be very strong evidence of trade in that direction. If other factors point to probability of such trade, the possible presence elsewhere, or locally, of an unknown source of that rock or mineral can not greatly depreciate the value of that piece of evidence.

The greatest value of this technique, as applied to date, seems to me to lie in the study of 2 groups of pottery from separate places which seem to be identical on the basis of visual observation. The establishment of mutually exclusive differences in mineral content between these 2 groups is excellent evidence for the assumption that they were not made at the same place. Furthermore, if each of those 2 groups can be shown to be similar, in mineral content, to other series found in the same site or local area with the given group, then the evidence is good for concluding that each was manufactured in the locality in which it was found.

Precise spectrographic analysis of potsherds has demonstrated the impossibility of determining the mineral content of pottery, clays and paints, and, in most cases, the nature of the introduced "temper" by examination with a "pocket" magnifier.⁵⁸ This does not mean that certain other things of value can not be observed.

One of the most important results of recent work along these lines has been the knowledge of prehistoric ceramic technology which Anna O. Shepard, the leader in this field, has obtained in conjunction with her analytical work. Not satisfied with examining the mineral contents of the pottery, she has also made an extensive study of methods of manufacture and firing which has given us much additional valuable insight into Pueblo household industries.⁵⁹

Miss Shepard has made spectrographic analyses of a series of potsherds from Site 13 on Alkali Ridge, in connection with the work of Earl Morris in similar sites in the La Plata region, southwestern Colorado.⁶⁰ The series thin-sectioned by Miss Shepard totaled 15, including 14 potsherds of the type known as Abajo Red-on-orange and a single sherd of the type known as La Plata Black-on-red. Her study showed that the sherds from Alkali Ridge, including the La Plata Black-on-red specimen, contained rock differing from any so far observed in sherds from the La Plata sites.

The results of her study, which are published in Morris' La Plata report,⁶¹ were as follows:

Paint of the Alkali Ridge type is characteristically a red-brown and contains a variable amount of granular material consisting principally of magnetite and quartz. The surface, having been polished, is smooth and lustrous in spite of the sandiness of the material. The paint has no appreciable relief, and frequently a depression is left when it is removed, showing that it was well embedded in the clay. The mineral grains are plainly visible, however, and can most readily be recognized by their reflection of light. This paint resembles both in color and in the presence of magnetite and quartz inclusions, the red iron oxide paint found on a few La Plata red ware sherds. The paint of the Alkali Ridge ware was sometimes darkened by reducing conditions, so that it approaches black, but these specimens can always be reddened by refiring in an oxidizing atmosphere. One black, not thus changed, was found among the sherds examined. It is similar in color and texture to the typical La Plata black-on-red ware paint and, like it, contains manganese. It may be questioned whether this specimen could have been an intrusive from the east and the La Plata red paint specimens intrusives from the Alkali Ridge region. The characteristics of paste give no confirmation of such an interpretation. The temper of the Alkali Ridge red-on-orange specimens is composed of variable proportions of sand and rock fragments. The sand is principally quartz, a few grains of which are stained with iron oxide. The rock, considerably altered and very friable, consists of crystals of oligoclase and of altered hornblende in a granular groundmass in which quartz is prominent. Epidote is an alteration product of both the feldspar and the hornblende. Some hornblende crystals are entirely replaced by a fine brown platy mineral, pos-

⁵⁸ Shepard, 1936, particularly p. 406.

⁵⁹ Shepard, 1936, 1939.

⁶⁰ Morris, 1939.

⁶¹ Morris, 1939.

sibly a chlorite oxidized in the firing of the pottery. Accessories are magnetite, titanite, and apatite. Some rock fragments show evidences of strain and crushing. Fragments of crypto-crystalline rock with skeletal crystals of plagioclase also occur in several sherds and one specimen contains a few particles of potsherd, possibly of accidental occurrence.

The presence of the same rock in all 15 of the sherds thin sectioned, including that with the black

iron manganese paint, proves identity of source of temper. This rock differs texturally and mineralogically from any so far found in La Plata black-on-red ware. It appears therefore that the exceptional paints in each district represent deviations in technique rather than trade. The black-on-red ware of the intervening area has not yet been studied, however, and for the present the origin and relationships of La Plata black-on-red ware must remain open questions.⁶²

THE TAXONOMY OF ALKALI RIDGE POTTERY

There is a degree of coxcombry, I believe, in everything: you have heard, I make no doubt, that greyhounds are either black, or white, or black and white; and if you have any faith in those who say they know best, they will tell you that there are no others — that all not being of the fashionable colour are curs, and not greyhounds.

— PETER BECKFORD

Vessels and sherds approximating the following taxonomic pottery types, in so far as it has been possible to force the pottery into the definitions of the types, were discovered on Alkali Ridge. Most of them have been previously described and references will be given to the reports in which the descriptions occur. Three types have not been previously described in accordance with accepted taxonomic procedure, and these will be so described below. The sites at which each pottery type occurred are listed after the type. Occasional Lino Gray sherds were found at all sites, and occasional Mancos Black-on-white sherds were found in and on the surfaces of all sites. In taxonomic listing these finds present a problem, because examples of any sherd type which appears in profusion at a given time may be and often are found in small numbers in all sites of both former and subsequent times in the vicinity. In general chronologically intrusive pottery types are found *in* sites of later date and *on the surface of* sites of earlier date. The situation may be further compli-

cated, however, by such factors as erosion, rodent activity, and the growth and decay of the roots of trees. It will, consequently, be assumed that this phenomenon occurs, and site associations will be given in only those cases where it is believed that the type was a "living" style.⁶³

Footnote ‡ in table 8, opposite, indicates one of our greatest taxonomic problems, the difference in point of view between the "lumpers" and the "splitters." In this instance I am a "lumper." The sherds presented herein as Mancos Black-on-white or as Pueblo II black-on-white from Alkali Ridge are the sherds which regularly occur at those sites, all of them. And for my present purpose of showing the differences between our so-called Pueblo II sites and eighth-century Site 13 on the one hand and the Mesa Verde Pueblo III sites on the other, it is the most useful way for me to classify them. I realize that for students with other purposes in mind this classification is not the most useful. But we must always remember the direct functional relationship between the classifica-

⁶² Shepard, 1939.

⁶³ In a recently published discussion of the pottery of the Kayenta area the usefulness and the limitations of the Southwestern taxonomic systems have been admirably summed up. "This method of classification has been highly successful . . . in determining the general chronology of sites and, to a lesser extent, the trade relations which existed among them. Pottery fragments gathered from the surface of a small site are often sufficient for relative dating, thus allowing large numbers of sites to be surveyed rapidly and at slight trouble or expense. . . . Pottery typology on this basis is a simplification of the situation, justified because it facilitates the use of sherds as dating fossils. . . . But such a system cannot adequately deal with the close analysis of ceramic material, nor with its study from the viewpoint of a historical sequence. An attempt to pursue typology into such a

detailed study would lead to an unending multiplication of typological literature . . . and to a group of descriptive criteria that would be too cumbersome . . . to use. . . . Furthermore, although the individual classification of specimens in biological taxonomy forms the framework of evolutionary study, a similar exact pottery taxonomy is not analogous. In the field of zoology a very intricate system of typology has been created, based on the genetic relationships of living organisms; yet it merely describes animals that inherit from two parents of the same species, usually from the same locality. A pottery vessel may receive its constituents of design and technique from a much more variable group . . . some coming from a considerable distance. Also 'interphylum breeding' takes place; for example the copying of basketry designs on pottery." Beals, Brainerd, and Smith, 1945, p. 87.

TABLE 8. Taxonomic pottery types in Alkali Ridge sites.

TYPE	DESCRIBED IN	FOUND IN SITES	PERIODS
Lino Gray	Colton and Hargrave, 1937, p. 191.	2, 7, 13	BM III-P I
Lino Black-on-gray	Colton and Hargrave, 1937, p. 194.		
La Plata Black-on-white	Hawley, 1936, p. 23.	2, 7, 13	BM III
Lino Fugitive Red	Colton and Hargrave, 1937, p. 191.	2, 7, 13	BM III-P I
Kana-a Gray	Colton and Hargrave, 1937, p. 195.	13	P I
Abajo Red-on-orange	see below	7, 13	P I
Abajo Polychrome	see below	13	P I
Abajo Black-on-gray	see below	13	P I
La Plata Black-on-red	see footnote *	7, 13	P I
Kiatuthlanna Black-on-white (Pueblo I, East, Black-on-white, iron paint) †	Hawley, 1936, p. 23.	7, only 1 sherd found on Alkali Ridge (fig. 135, b)	P I
Mancos Black-on-white ‡	Colton and Hargrave, 1937, p. 230.	2, 3, 5, 7, 8, 9, 10, 11, 12, and at Units 1, 2, and 4 at Site 13	P II
Tusayan Black-on-red §	Colton and Hargrave, 1937, p. 74.	1, 2, 3, 5, 7, 8, 9, 10, 11, 12, and at Units 1, 2, and 4 at Site 13	P II
Tusayan Polychrome	Hawley, 1936, p. 39.	5, 6, 6b, 9, 11, 12	P II-III
McElmo Black-on-white	Hawley, 1936, p. 31.	1, 6, and at Units 1 and 3 at Site 13	P III
Mesa Verde Black-on-white	Hawley, 1936, p. 37.	1, 6, and at Units 1 and 3 at Site 13	P III
Tusayan Corrugated ¶	Colton and Hargrave, 1937, p. 196.	all except the Abajo Phase of Site 13	P II-III
Moenkopi Corrugated	Colton and Hargrave, 1937, p. 197.	2, 3, 5, 7, 8, 9, 10, 11, 12, and at Units 1, 2, and 4 at Site 13	P II-III

* Not fully described, taxonomically, and not described in this report because of the small number of sherds found which correspond to the type as used by Martin and Rinaldo, 1939. However, complete spectrographic descriptions of a large number of sherds which would be included in this classification are to be found in Shepard, 1939, in the section dealing with Pueblo I black-on-reds. Very similar to or identical with Bluff Black-on-red (Hargrave, 1936, p. 31).

† Reed uses the term, Piedra Black-on-white, for this ware in his Mancos Canyon sites. Hawley, 1936, lists Piedra as "Rio Grande form of P I East."

‡ Mancos Black-on-white includes sherds resembling various types in the taxonomies, including Dogoszhi, Deadmans, Sosi, and Flagstaff Black-on-whites in northeastern Arizona; Escavada and Gallup Black-on-whites in the Chaco region. Some of the sherds shown in the Mancos illustrations are probably imports. However, the plates themselves will show the wide range of design types found in every Pueblo II site. I believe that most of these were made locally. To equate them with distant taxonomic types on the basis of design resemblances seems to me to be unwise and misleading.

§ In addition there were various black-on-red sherds showing resemblances with similarly colored wares from northeastern Arizona and northwestern New Mexico (such as Deadman's Black-on-red, Colton and Hargrave, 1937, p. 71; Wingate Black-on-red, Hawley, 1936, p. 48, etc.). See also Reed, 1944a and b.

|| Colton and Hargrave divide this into Tusayan and Citadel Polychromes.

¶ There was a wealth of corrugated pottery which does not fit into the corrugated types described in the taxonomic manuals.

tion and the purpose for which it is to be used (see "The Use and Abuse of Taxonomy," above). Students with different purposes must devise classifications to fit those purposes. And, I repeat, the single-ideal-classification does *not* provide this multiple basis for operations. It is in that type of classification that the inconsistencies arising from the work of "lumpers" and "splitters" is most noticeable. The difficulty is not peculiar to archaeologists. The following statement is from a paper on palaeontological systematics.⁶⁴ "... there remains always with us a constant source of difficulty and unevenness, the difference between the 'lumpers'; who tend to see the resemblances between organisms, and the 'splitters' who are always on the lookout for differences. The results are often very misleading. If, for example, the Jurassic members of a group are worked out by a 'lumper' and the Cretaceous members by a 'splitter'; the resulting genera and species will not be proportional to the relative diversity of the group in the two formations. . . . Zuckerman (1931) has pointed out how different our ideas of the evolution of man would be if, in distinguishing Neanderthal from modern man, the same values were attributed to the characters used as is customary in distinguishing Pithecanthropus, Sinanthropus, and Eoanthropus."

In table 8 three new types are listed. These will now be described in the fashion of the taxonomic manuals.

ABAJO RED-ON-ORANGE (NEW TYPE)

SYNONYMS. Montezuma Red-on-orange; "Jo Brew's ware."

ILLUSTRATIONS. This report, figures 52-66; 67, *m*; 99, *u*, *v*, *x-jj*; 101, *o-t*, in color; 102, in color; 104; 105; 108; 109; 110, *n-p*; Morris, 1939, plate 1, b, in color; Martin and Rinaldo, 1939, figures 125-128, 131, 132; Martin and Willis, 1940, plate 57.

TYPE SPECIMENS. Peabody Museum Collection from Alkali Ridge.

TYPE SITE. Abajo: 7: 13, Alkali Ridge, San Juan County, Utah.

STAGES. Basket Maker III-Pueblo I,⁶⁵ Abajo Phase, Abajo Focus.

TIME. Eighth century, A.D., perhaps earlier.

DESCRIPTION. Constructed: probably by concentric bands. Fired: in oxidizing atmosphere. Temper: sand and rock fragments, see Miss Shepard's description (p. 251, above). Vessel walls: strong. Core texture: fine. Core color: pink to gray, may have gray in center of core, on 1 side, or throughout core; sur-

face finish: smooth, no slip. Surface color: usually pink, ranges to gray, outside of bowls often gray, or gray in spots while at the same time the inside is pink (see pp. 259, 261; table 9). Firing clouds: common; usually gray in color. Forms: bowls, jars with necks, globular jars without necks, cups, "squash-jars," "double jars," no ladles, no pitchers. Rims: flat, slightly incurved on bowls, often painted red on bowls. Walls: thin, minimum 1.2 millimeters, maximum 1.3 centimeters, usually 3 to 6 millimeters. Painted decoration: color, red through various wine and plum colors to black; red by far the most common (see p. 259 and table 9 and color plates, figs. 101, 102). Pigment: red iron oxide paint, see Shepard (p. 251, above). Regions decorated: interior surfaces of bowls, exterior surfaces of jars, tops of rims. Design: see figures 52-66; 67, *m*; 99, *u*, *v*, *x-jj*; 102; 101, *o-t*; 104; 105; 108; 109; 110, *n-p*.

COMPARISONS. Designs nearest to Basket Maker II, Basket Maker III, and Pueblo I baskets and La Plata and Bluff Black-on-red pottery. A few striking parallels with Pueblo I bowls from the Piedra region of southwestern Colorado⁶⁶ and Dragoon Red-on-brown from southeastern Arizona.⁶⁷

RANGE. Known range, northern mesas of the San Juan from Cottonwood Wash in Utah to the Animas in Colorado and New Mexico. Probably more extensive.

ABAJO POLYCHROME (NEW TYPE)

A few sherds of Abajo Red-on-orange with black paint added have been found. There is considerable variation in the black paint used, probably indicating experimentation. Some sherds seem to have vegetable and some mineral black paint. They have not been submitted to spectrographic analysis. Abajo Polychrome may well mark the beginning of polychrome pottery in the San Juan. The level from which it comes at Site 13 can be dated as early Pueblo I, typologically, and in the 8th C. A.D. by tree-rings.

ILLUSTRATIONS. This report, figure 101, *a-l*, *n*, in color; Morris, 1939, plate 1, d, in color; Martin and Rinaldo, 1939, figure 130.

ABAJO BLACK-ON-GRAY (NEW TYPE)

A few sherds were found in the Pueblo I levels at Site 13 which, although bearing designs identical with those in the Abajo Red-on-orange series were, in color, actually black-on-gray. They were very rare, constituting a small fraction of 1% of the painted sherds in the Pueblo I levels. However, their definite

⁶⁴ Arkell and Moy-Thomas, 1940, p. 397.

⁶⁵ See footnote 6, p. 233, and statement on p. 256.

⁶⁶ Roberts, 1930.

⁶⁷ Fulton, 1934, 1938 and Fulton and Tuthill, 1940.

black-on-gray color plus their divergence from typical Pueblo I black-on-gray designs (Kana-a) seem to merit separate taxonomic listing. In all respects save color they are identical with the Abajo Red-on-orange. The ground color is somewhat variable from light to dark but in most cases is a medium to deep gray. Experiments at the Peabody Museum indicate that this type is but a firing variation of Abajo Red-on-orange, albeit the resulting color-effect is distinctive. This conclusion is supported by figure 101, *u* where orange color appears in the body of the paste along the fractured edge and on part of the exterior,

although the body-color on the interior is a solid gray. ILLUSTRATIONS. Figure 101, *u*, *v*, in color.

I hope the descriptions of these 3 news types will be useful. The designs can be studied in the illustrations of this report. The Peabody Museum has a large collection of Abajo Red-on-orange sherds which are available to those who wish to examine the technical features of the pottery. Unfortunately, the supply of Abajo Polychrome sherds is limited to those shown in figure 101.

POTTERY SHAPE

In the absence of generally used standard terminology, the utility of lengthy discussions of the shapes of pots and the designs on them may be questioned. Certainly, I believe, illustrations are much more useful, and all variations in shape and decoration of pots found by the Peabody Museum Southeastern Utah Expedition are included in the plates and figures. The present discussion of pot shapes and designs will be restricted to a listing of the outstanding characteristics in the 3 major groups found. These groups are (1) Basket Maker III-Pueblo I, which covers the La Plata and Abajo Phase-Focus, (2) Pueblo II, which is the Mancos Mesa Phase, and (3) Pueblo III, which is the Mesa Verde, divided by some into the McElmo and Montezuma Phases. References will be found to plates and figures in this report and footnote references to illustrations in other reports. No references are made to Morris, 1939, or to Martin, 1936 through 1939, or to Beals, Brainerd, and Smith, 1945. Those reports are full of illustrations of similar vessels and wares and should be used in conjunction with this paper.

Group 1: Basket Maker III-Pueblo I

Earliest phase of Sites 2 and 7; most of Site 13.

- (1) Constricted neck but medium wide-mouthed undecorated jars, of various sizes,⁶⁸ figures 99, *a*, *d*, *g*; 100, *a-l*, *o*.

⁶⁸ Morris, 1919a, plates 66, *a*, *b*; 68, *a*; Roberts, 1929, plate 11, *a*; Roberts, 1930, fig. 15, plate 15; Roberts, 1931, plate 11, *a*.

⁶⁹ Morris, 1919a, plate 68, *c*.

⁷⁰ Roberts, 1929, fig. 30, *b*.

- (2) The same, small, with banded neck,⁶⁹ figure 99, *p-s*.
- (3) Large jar, narrow, bottle-shaped neck, with and without lugs or handles,⁷⁰ figure 100, *m*, *n*, *p*.
- (4) Undecorated globular jar without neck, with and without lugs. This is one of the standard diagnostics for Basket Maker III,⁷¹ figure 99, *b*, *c*, *h*, *j*, *t*.
- (5) Incurved rim decorated bowl, with and without lugs, pierced lugs, and holes for suspension; flatter top than (4), probably predecessor of the "seed bowl,"⁷² figure 99, *z*, *aa*, *cc*, *ff*: designs shown on figure 52.
- (6) Undecorated pitchers, figure 99, *k*, *o*, *w*.
- (7) "Bird" or "duck" jars, decorated and undecorated, figure 99, *f*, *kk*.
- (8) Miniature vessels of various shapes, decorated and undecorated, figure 99, *a-i*.
- (9) Same as (3), decorated, figures 99, *gg*; 102, *m*, *o* (neck only).
- (10) Decorated cup, figures 52, *m*, *o*; 99, *bb*.
- (11) Decorated "double jar," figures 52, *l*; 99, *ee*.
- (12) Shallow, wide, decorated bowls, often with very slight incurve at rim.⁷³ The bowls are quite distinct in form from those of later Pueblo sites, figures 99, *u*, *v*, *x*, *y*; 102, *c*, *n*; 104, 105: drawings of designs on figures 52, *r*; 53-66; 67, *m*. Also undecorated, figure 110, *a-c*, *g*.
- (13) Decorated, imitation-gourd bottles⁷⁴ and jars, figures 52, *a*, *b*; 99, *bb-jj*.

No ladles or decorated pitchers were found. Many "re-used" sherds were found, some of which may have served as ladles, figure 165.

⁷¹ Kidder and Guernsey, 1919, plate 59; Roberts, 1929, fig. 29, *a*.

⁷² Roberts, 1929, fig. 29, *b*; Roberts, 1930, fig. 17, *c*, plate 20.

⁷³ Morris, 1919a, plates 64 and 65.

⁷⁴ Morris, 1919a, plate 72; Morris, 1927, fig. 33.

There are also certain indications in the sherds of the presence of the large, deep basin with lugs described by Roberts as "large bowls used in cooking"⁷⁵ (fig. 110, *q*).

Some of these shapes may be classified as Basket Maker III and some as Pueblo I as the periods are now defined. As was shown on pages 32-43 above, there is no real agreement on the fine points between Basket Maker III and Pueblo I, but in the closely-knit sequential development now presented by the archaeological evidence these disagreements seem of little importance. This observation will be found to apply to pottery decoration as well as to shape.

Group 2: Pueblo II

Sites 2, 3, 5, 7, 8, 9, 10, 11, 12, Units 1, 2, and 4 at Site 13.

Corrugated ware

- (1) Large, wide-mouthed jars, often called ollas,⁷⁶ figure 152, *g, j-p*.
- (2) Medium- and small-sized jars of same shape,⁷⁷ figures 152, *a, d-f*; 153, *c, b, k*.
- (3) Medium-sized and small squat jars⁷⁸ (wider in proportion to height than the above), figures 152, *b, c*; 153, *j*.
- (4) Large corrugated jars with narrow necks.⁷⁹
- (5) Small corrugated jars with handle,⁸⁰ figure 153, *d*.
- (6) Molds or platters, figure 153, *f*.

Black-on-white ware

- (1) Thin, straight-lipped bowls of typical Puebloan shape.⁸¹ Lips of varying thickness but never attaining the thick flat lip of Pueblo III, figure 111, *q, t, v*.
- (2) Large jars with short, narrow necks, with strap handles at the widest part,⁸² figure 112, *a-d, f*.
 - a. Indented strap handles,⁸³ figure 112, *a*.

b. Handles depressed,⁸⁴ figure 112, *c, d*.

c. Handles tilted upward, figure 112, *f*.

- (3) Large jar similar to the above but with gentler neck (not rising at a sharp angle) and no handles,⁸⁵ figure 112, *e*.

- (4) Bowls with higher, steeper walls than (1), figure 111, *r, u*.

- (5) Large bowls with horizontal strap handles, depressed, figure 111, *s*.

- (6) Ladles (true half-gourd⁸⁶ ladles not found). The following type handles were found; most of them are shown in figure 146.

a. "Vestigial" half-gourds.

i. "Barred" half-gourd, bowl part and handle depression separated by ridge.⁸⁷

ii. Uniform width trough.⁸⁸

iii. Trough filled in solid but with slight raised border, last remnant of half-gourd type.

b. Solid handles.

i. Flat and wide.⁸⁹

ii. Slightly flattened oval.⁹⁰

iii. Round.⁹¹

c. Hollow round.⁹² Hollow round handles are very scarce before Mesa Verde times. Only one has been found in the Pueblo II sites on Alkali Ridge. The hollow handle with holes in it, common in the Mesa Verde, has not been found at all.

- (7) Pitchers: many pitchers were found which may be divided among 3 classes.

a. Small body, short neck, with handle from shoulder to three quarters up the neck, figure 111, *b*.

b. Small body, tall neck, with handle from base shoulder almost to top of neck, figure 111, *f, j, m*.

c. Large body, large neck, with handle on neck, figure 111, *l, o, p*.

Various gradations between these types exist. Figure 111, *d, e, i, n*.

- (8) "Seed bowls": rather rare; in general 2 types.

a. Flat top, sharp shoulder, small; figure 111, *b*.

⁷⁵ Roberts, 1930, pp. 85, 86, plate 16.

⁷⁶ Morris, 1919a, plate 63, *a*; Kidder and Guernsey, 1919, plates 57, *b*, 58, *g, h*; Holmes, 1886, fig. 239; Roberts, 1932, plates 21, 22, *a, b*.

⁷⁷ Holmes, 1886, fig. 247; Roberts, 1932, plates 22, *c, d*, 23, *b, c, e*.

⁷⁸ Kidder and Guernsey, 1919, plate 58, *a*; Holmes, 1886, fig. 250; Roberts, 1932, plate 23, *a, d*.

⁷⁹ Holmes, 1886, figs. 243, 245.

⁸⁰ Holmes, 1886, fig. 249; Kidder and Guernsey, 1919, plate 58, *e*.

⁸¹ Kidder and Guernsey, 1919, plate 54, *d*.

⁸² Kidder and Guernsey, 1919, plate 53, *a*.

⁸³ Roberts, 1932, plate 24, *c*; Nordenskiöld, 1893, plate XXXI.

⁸⁴ Roberts, 1930, plate 18, *a*; Nordenskiöld, 1893, plates XXXI and XXXII.

⁸⁵ Kidder and Guernsey, 1919, plate 53, *b*.

⁸⁶ Nordenskiöld, 1893, plate XXX, 2, 4; Kidder and Guernsey, 1919, plate 58, *d*; Roberts, 1930, plate 30, *b*; Roberts, 1931, plate 18, *a*.

⁸⁷ Roberts, 1931, plate 18, *c*.

⁸⁸ Nordenskiöld, 1893, plate XXIV, 7, XXX, 3; Roberts, 1932, plates 30, *a*, 34, *e*.

⁸⁹ Kidder and Guernsey, 1919, plate 58, *b*.

⁹⁰ Nordenskiöld, 1893, plate XXIV; Roberts, 1932, plate 30, *c*.

⁹¹ Nordenskiöld, 1893, plate XXX, 5, 6; Roberts, 1932, plate 29; Holmes, 1886, fig. 300.

⁹² Roberts, 1932, plate 34, *c*.

b. Medium size, more gentle shoulder;⁹³ figure 111, *a, c*.

- (9) Tall bowls molded in flat-bottomed, steep-sided baskets, figure 153, *e, e'*.

Group 3: Pueblo III

Site 1, last phase of 2, 6, Units 1 and 3 at Site 13.

Black-on-white ware

- (1) Predominant form: the Mesa Verde bowl; heavy ware, thick, flat, dotted, straight rim.⁹⁴
- (2) Ladles were not so common as in the last group. Handles were round or roundish with slight flattening. Handles both solid and hollow. Some of the hollow ones had small holes in them.
- (3) The presence of jars with strap handles was indicated by the sherds; no restorable specimens were found.
- (4) Incurved rim bowls and pitchers were very scarce; the latter apparently was superseded by the Mesa Verde mug (see below).

NEW FORMS, FOUND ONLY IN THE MESA VERDE

- (5) The Mesa Verde mug;⁹⁵ flat bottom, figure 153, *a, b*.
- (6) Kiva jar: a large, incurved rim jar with cover resting on ledge inside mouth.⁹⁶ So called because so often found in kivas on Mesa Verde. Figures 114, *k, k'*; 191, *j*.

Corrugated Ware

Corrugated ware is smoother, more standardized, in coiling technique, indentation, and shape. Tendency for jar shoulders to be sharp has passed; rims are heavier (fig. 149, *m*), more regular in their outcurve; and that outcurve tends to be greater. Although the work is more regular, and the coils finer, the walls tend to be thicker, particularly in the larger pieces. A large jar figured by Holmes illustrates the more rounded shape.⁹⁷ This shape is found in earlier corrugated ware but only rarely, and then usually in small vessels, figure 153, *i*.

Pueblo III Plain Ware

A resurgence of plain blue-gray unpainted pottery occurs in Pueblo III times. The paste seems to be the same as that of the corrugated ware. It is carefully smoothed but not polished. At Site 1, Unit 1, we found a large water jar with strap handles and a large deep basin of this ware, neither restorable, also the jar neck in the sipapu of the kiva (fig. 175, *d*).

This list does not, in all probability, include every form in use at any given time in the sites. It represents only those which we found, intact or restorable, and those which we could identify positively from the sherds.

POTTERY DECORATION

The intricacy of the motifs and arrangements used (on Pueblo pottery) minimizes the possibility of their independent invention, and there is enough variety in the design of the various cultural centers to allow a statistical treatment of the elements isolated. Such a study, so far almost untouched, could profitably be carried on with already excavated material. Aided by the accurate dating now available on many sites, it should be a peculiarly sensitive means of tracing cultural interchange.

— BEALS, BRAINERD, AND SMITH

It seems desirable to look at Pueblo pottery decoration from 2 main points of view: the chronological and the technological. In the following discussion, presented in a framework of the Pecos Classification, both of these viewpoints will be emphasized. The Pecos Scheme is used, because it is the least distorting and the best known. The actual periods cannot be dated on Alkali Ridge, and their usage here means

no more than that material labeled Pueblo III follows that labeled Pueblo II and pottery called Pueblo II follows that called Pueblo I.

Technically speaking, Pueblo pottery decoration is best considered, again, in 2 groups: painted wares and unpainted wares. The latter group includes corrugated wares, incised wares, and such oddities in the Southwest as noduled, stroked, and basket-molded wares.

⁹³ Holmes, 1886, fig. 310.

⁹⁴ Kidder, 1924, fig. 9, *a*; plate 25; Fewkes, 1909, plates 16, 17, 18.

⁹⁵ Holmes, 1886, figs. 287, 288; Nordenskiöld, 1893, plate XXIV, 1, 3, 4, 6; Fewkes, 1909, plate 19, *b*; Prudden, 1914, plate V, *e*; Prudden, 1918, fig. 12; Kidder,

1924, fig. 9, *d*, plate 27, *a*.

⁹⁶ Holmes, 1886, fig. 279; Nordenskiöld, 1893, plate XXIX, 5, 7; Prudden, 1914, plate V, *c*; Prudden, 1918, plate IV, center; Kidder, 1924, fig. 9, *f*.

⁹⁷ Holmes, 1886, fig. 253.

In the painted wares, designs were applied originally to the main body of the pot. In later times they were usually, but not always, painted on a wash or polished slip of clay, distinct in character from the clay of the body-paste.

Painted designs appear almost universally upon the insides of straight-rimmed bowls and on the outsides of small-necked jars ("water jars"), pitchers, bottles, cups, "seed bowls," "kiva jars," and incurved-rim vessels in general. Designs painted on both inside and outside occur more often on the ladles, and ladle handles are often decorated.

The decoration on unpainted wares, corrugation, incision, etc., always is found on the outside, mostly on large and small jars. Occasional bowls are found with painted black-on-white decoration inside and corrugation or basket-molding on the outside.⁹⁸

One of the main principles of this section of the report will be to let the designs speak for themselves. Many of them are quite eloquent; all of them can do better on their own than when transposed into words upon a page. Words, so far, have proved singularly inadequate for the description of pottery designs. Part of this has been due to a persistent lack of standardization in design terminology. In an attempt to correct this deficiency the Clearing House for Southwestern Museums at Denver has circulated questionnaires and from the replies has prepared a terminology. This will be used herein.

Much of our difficulty here is, however, on a more fundamental level than the terminological. Techniques for the study of pottery design are still in their infancy. To me, the most impressive treatment of the subject is the study of pottery designs of the Kayenta area by George W. Brainerd and Watson Smith, newly published.⁹⁹ It is especially important in connection with the Alkali Ridge pottery because of close cultural relationships in many wares, particularly the red-on-orange and many of the Pueblo II design types. The splendid drawings in it should be used for comparison with our illustrations as should also Morris, 1939; Martin's southwestern Colorado papers; Roberts' Piedra paper; and the reports of recent University of New Mexico work in Chaco Canyon.

By viewing this material together a reasonably good picture of ceramic design in the San Juan can now be obtained.

In our attempt to let our designs do their own talking we have presented *in toto* all designs found whole and all designs which could be restored satisfactorily. In addition we have attempted to show all of the individual design elements in the potsherd plates, with size range for the most important elements and also with examples of their use in combination with other elements in patterns. The long legends which accompany the collotype plates at the rear of the volume are intended to be, with the plates themselves, an integral part of this chapter, and much of the material in those legends will not be repeated here.

The drawings of pottery designs which accompany this section of the report were made by Miss Eleanor Kerns and the author and a few, the decorated jars, by Elmer Rising. They were copied from whole and restored pieces and reconstructed from fragments. Reconstructed portions of the designs are not indicated. Experiments were made with conventions which would do this, but the results ran counter to the purpose of the drawings. The attempt to show 3-dimensional design by means of 2-dimensional drawings provides too much distortion as it is, without introducing an entirely different design factor, hatching, or some other ruse to show the restored part. The only object of the drawings is to give the reader visual impressions of the designs similar to those he would receive from observation of the actual specimen. This end is defeated by the use of conventions not related to the designs. Brainerd and Smith have made a statement on this point which seems worthy of quotation. "Restored portions of designs are not indicated in the drawings. Although this practice may be open to criticism, the increased legibility thus given the drawings must be its own justification . . . *no designs have been restored in which two alternative possibilities suggest themselves.*"¹⁰⁰ The italics are mine to emphasize the policy we followed in making drawings from Alkali Ridge fragments. Most of the layouts are simple and regular. Usually half a bowl will give the complete design.

⁹⁸ Holmes, 1886, figs. 244, 254.

⁹⁹ Beals, Brainerd, and Smith, 1945, pp. 87-168.

¹⁰⁰ Beals, Brainerd, and Smith, 1945, p. 95.

When there was doubt, no drawing was made.

Brainerd and Smith discuss, also, the limitations imposed by the necessity of reproducing the designs on a plane surface. Their statements apply equally well to the painted pottery of southeastern Utah. "The . . . design layouts used in this area allow nearly all of the structural lines of the designs on the pottery to be drawn sweepingly along a great circle of the more or less spherical surface of the pot. Much of the quality of the design is due to the complex curvature lent to straight lines by the curved surface on which they were drawn. In our illustrations . . . many of these lines have been conventionalized to appear straight. Such conventionalization allows the design on a hemispherical bowl interior . . . to be shown clearly and completely, but only at the expense of considerable distortion."¹⁰¹ In many cases we followed this practice, for example in figure 58, *a* and *b*. On the other hand when figure 58, *c* was drawn an attempt was made to indicate the curvature. Some readers may object to the fact that our technique was not standardized in this respect. To this objection I can only answer that in each case we attempted to place on the plane surface of the paper something which would give impressions closest to those obtained from the specimen itself. Every design was treated as an individual problem and, I think, properly so. With regard to the curvature of the lines, some came out one way, some the other.

It will be noted that the drawings of bowl designs in any given group are usually all of one size. This is a convention which has been quite generally used in the Southwest. We thought it useful, particularly in facilitating the comparison of designs, and adopted it.

BASKET MAKER III — PUEBLO I

Pottery found as "living-styles" in the earlier phases of Sites 2, 7, and 13, and occasionally as survivals or intrusive specimens in later horizons:

1. **Basket Maker III Black-on-white (Lino and La Plata).** Very rare: only bowls and bowl fragments: all designs found are shown (figs. 52, *s*, *t*; 103; 106; 107; 191, *g*).

Whether these few examples represent local manufacture or trade is not known. Good examples of the so-called basket-stitch design may be seen on figures 103, *dd*; 106, *a*; 107, *b*, and 191, *g*. Figures 103, *p* and 106, *b*, *d* foreshadow the wavy-line technique which was so common in Pueblo I times.

In southwestern pottery taxonomy the difference between Lino and La Plata Black-on-whites lies in the paint used; carbon paint for Lino and iron paint for La Plata. We seem to have both, with the latter heavily predominating.¹⁰²

The small amount of material of this type recovered, together with the doubt as to its place of manufacture, makes impractical any extensive discussion of design. Good comparative material is to be found in Morris, 1939, from the La Plata country in Colorado; in Roberts, 1929, from Chaco Canyon in New Mexico; and in the Kidder-Guernsey reports from the Kayenta region in Arizona.

Discussion of the status of "Classic Basket Maker III culture" on Alkali Ridge will be found on pages 291-92.

2. **Pueblo I Red-on-orange (Abajo Red-on-orange):** with a rather full range of off-color variants; a little-known type, extensively shown for the first time in this report (figs. 52-66; 67, *m*; 99, *u*, *v*, *x-jj*; 101, *o-t*; 102; 104; 105; 108; 109; 110, *n-p*). Figure 102 presents the run-of-the-mill reds in color; figure 101, *o-t* gives a selected range of color variation, off red. In the storerooms and pit houses of Site 13 the off-color wines and plums customarily ran from 10 to 30% of the red-on-orange. True black-on-gray, 101, *u*, *v*, at the end of the scale, presumably produced in a reducing flame, was very rare (see below).

Although a great range in color variation was encountered, the vast majority of bowls and sherds were restricted to a small range of ochreous reds (typical Indian reds) for the paint and a limited range of pink for the ground-color. It will be noted that the ground-color is for the most part pink rather than orange. However, since the ware is now so widely known as *red-on-orange*, it seems best to leave it at that. More properly it should be called Abajo Red-on-pink, but pink is not a popular

¹⁰¹ Beals, Brainerd, and Smith, 1945, p. 93.

¹⁰² This statement is based on visual observation only and is not exact, so exact figures are not given.



FIGURE 52

word in the Southwest. After the reception accorded Cosgrove's pink-on-terra cotta, it will take a braver man than I am to launch another pink in the Southwestern taxonomic whirlpool. The main colors are presented below in terms of the 2 most common American color dictionaries. Both dictionaries are used because, although the Ridgway does the better job for this kind of material, it is out of print and few people have copies. On the other hand the Maerz and Paul is reasonably satisfactory, is more widely distributed among North American archaeologists, and can still be obtained.

It must be understood that the colors listed below do not exhaust the range on Abajo wares, but most pieces can be matched by one of them or can be placed in an intermediate position between 2 of them. Similarly, not every color listed can be matched absolutely in the sherds to the satisfaction of a color expert, but these are the closest matches provided by the dictionaries.

In general, the off-color paints were found with the off-pink ground colors, but not always.

Those readers who are familiar with Pueblo painted pottery will readily understand that many colors listed in table 9, and intergrades between them, may be and are found on different parts of a single pot.

Designs were executed in these colors on the outsides of jars, bottles, and cups and on the interiors of bowls. The latter were the most numerous in the whole and restorable vessels and in the sherds as well.

Two different aspects of the decoration of the individual specimens will be described here: first, elements used; and second, general layout of the design. Bowl interiors will be considered first, because of their great preponderance.

The most popular design elements on bowl interiors, in order of numerical occurrence in the excavations, are as follows:

a) Broad, roughly parallel wavy lines, usually arranged in 3 layouts: across the bowl (figs. 57, *a*; 101, *p*; 102, *a*; 104, *a*, *b*); around the bowl in concentric circles (figs. 53, *b*, *c*; 56, *e*; 101, *u*); or, more rarely, in spiral formation from a circle in the bottom to the rim (fig. 54, *a*, *b*). The broad wavy line appeared also in other arrangements (figs. 54, *f*; 57, *f*; 58, *d*, *e*; 64, *a*; 101, *r*, *s*, *v*); in combination with other elements (figs. 54, *d*; 55, *d-f*; 56, *a*, *b*, *d*; 58, *b*, *c*; 59, *b*, *c*; 64, *f*; 66, *a*, *b*; 101, *c*; 102, *c*; 104, *c*, *e*, *i*; 105, *b*, *l*; 108, *f*; 109, *a*, *d*, *e*; 110, *n*, *o*); and as a design filler (figs. 57, *e*; 64, *e*; 65, *b-d*; 66, *d*, *f*; 105, *k*; 108, *a*, *g*). When used as a filler, the wavy line was usually narrower than under other circumstances (figs. 64, *e*; 108, *g*). In a few instances wavy-line ticks were found (fig. 52, *r*). The 6 graduated pendant wavy lines in figure 64, *f* are not strictly speaking ticks, since they play a very important part in the rotational symmetry of the design.¹⁰³

It will be noted that there is considerable variation in the wavy line, often on a single pot. One is tempted to infer that figures 56, *e* and 67, *m* were made in order to show this varia-

LEGEND FOR FIGURE 52

DRAWINGS OF DESIGNS ON POTTERY VESSELS FROM PUEBLO I LEVELS AT SITE 13: wares, all Abajo Red-on-orange, save *f*, with a design on a Lino Gray paste, and *s*, *t*, Basket Maker III black-on-white.

PROVENANCE IN SITE 13

<i>a</i>	Room 99A	<i>k</i>	Room 240A
<i>b</i>	" 213	<i>l</i>	Pit House B, floor
<i>c</i>	" 113	<i>m</i>	Room 100A
<i>d</i>	Pit House G, floor	<i>n</i>	" 302
<i>e</i>	Room 10, near floor	<i>o</i>	Pit House B, floor
<i>f</i>	Room 240A	<i>p</i>	Room 113
<i>g</i>	" 99A	<i>q</i>	Pit House H, fill
<i>h</i>	" 99	<i>r</i>	Room 302
<i>i</i>	" 100A	<i>s</i>	" 212
<i>j</i>	Pit House A, near floor	<i>t</i>	" 222A

¹⁰³ For discussion of rotational symmetry, see pp. 269-70.

TABLE 9. Colors on Abajo Red-on-orange pottery.

Paint Color: run-of-the-mill:

Maerz and Paul:

Plates 4, 5, 6, lower half: Indian Reds, Roses, Coppers, Hennas, Cedars, etc.

Ridgway:

Plate I: Morocco Red, Claret Brown.

Plate II: Mahogany Red.

Plate XIII: Coral Red, Dragon's-blood Red, Brick Red.

Plate XIV: Vinaceous-Rufous, Ferruginous, Hay's Russet.

Plate XXVII: Ochre Red, Indian Red, Mineral Red, Prussian Red, Deep Corinthian Red.

Paint Color: variations from the usual reds:

Maerz and Paul:

Plates 46, 47, upper left quarter, particularly 47E2-E6.

Plates 53-55, upper left quarter.

Ridgway:

Plate XXXVIII: Dark Vinaceous-Purple, the Corinthian Purples, Neutral Red, Indian Purple, Mars violet.

Plate XXXIX: Deep- and Dark Livid Brown, Dark Vinaceous Brown.

Plate XLIV: Dark Slate-Purple, Anthracene Purple, Taupe Brown.

Plate L: Heliotrope-Slate, Dark Heliotrope-Slate, Vinaceous Slate.

Body Color: run-of-the-mill:

Maerz and Paul:

Plates 1-3, lower half: Shrimp, Coral, Rose, and Strawberry pinks.

Plate 12E7, and vicinity: Cinnamon, Bran.

Plate 13: same region as 12.

Ridgway:

Plate I: Strawberry Pink.

Plate II: Bittersweet Pink, Light Salmon-Orange.

Plate XIV: Salmon Color, Carrot Red, Flesh-Ochre.

Body Color: variations from the usual pinks.

Maerz and Paul:

Plate 14, upper left quarter: grays and drabs.

Plate 46, A1-D1 to A4-D4: grays and purplish drabs.

Plates 53, 54: rose tinted grays in upper left corner, as above.

Ridgway:

Plate XXVIII: Light Congo Pink, Vinaceous-Pink, Buff-Pink, Japan Rose, Onion-skin Pink.

Plate XXIX: Vinaceous-Cinnamon, Pinkish Cinnamon, Orange-Cinnamon, Cinnamon.

Plate XXXIX: Brownish Vinaceous, Light Russet-Vinaceous.

Plate XL: Vinaceous-Buff, Vinaceous-Fawn, Avellaneous.

Plate XLV: Pallid- and Pale Vinaceous-Drab, Pallid- and Pale Brownish Drab.

Plate XLVI: Pale Drab-Gray, Drab-Gray, Pale Smoke Gray, Smoke Gray.

LEGEND FOR FIGURES 53-56

DRAWINGS OF DESIGNS ON POTTERY BOWLS FROM PUEBLO I LEVELS AT SITE 13: ware, Abajo Red-on-orange. Designs with circular or spiral basic motif.

PROVENANCE IN SITE 13

FIG. 53		FIG. 54		FIG. 55		FIG. 56	
a	Room 293	a	Room 245A	a	Room 302	a	Room 221
b	" 241	b	" 200	b	" 297	b	surface
c	" 214	c	" 297	c	" 214	c	Room 75
d	" 105	d	Pit House G, floor	d	" 109	d	" 218
e	" 302	e	Room 86	e	" 99A	e	" 99A
f	" 75	f	" 242A	f	" 240	f	surface

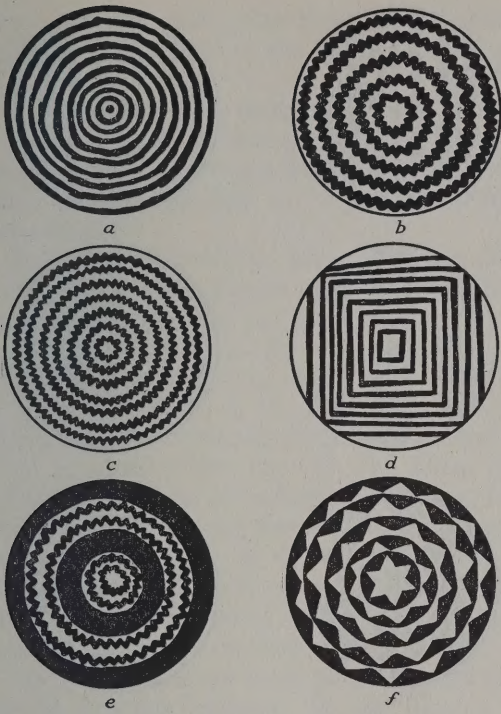


FIG. 53

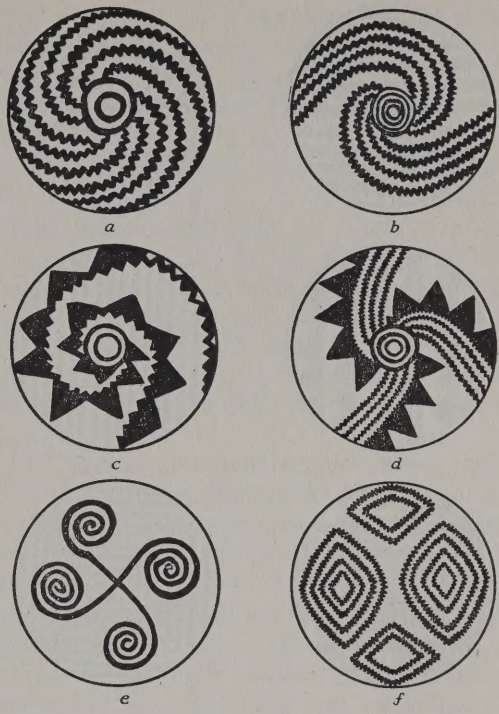


FIG. 54

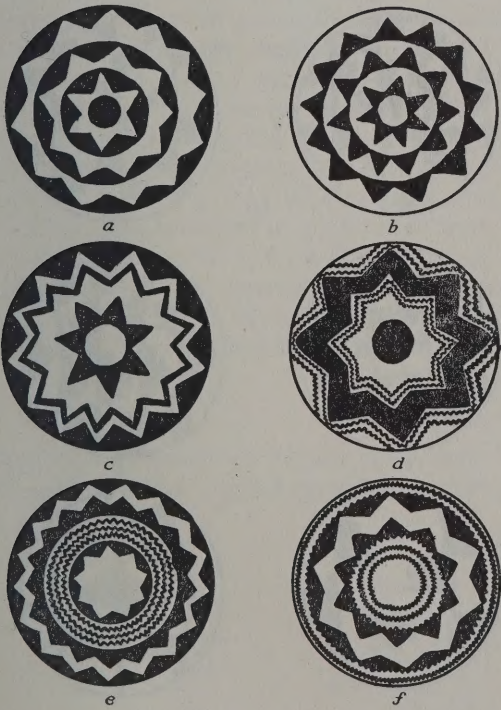


FIG. 55

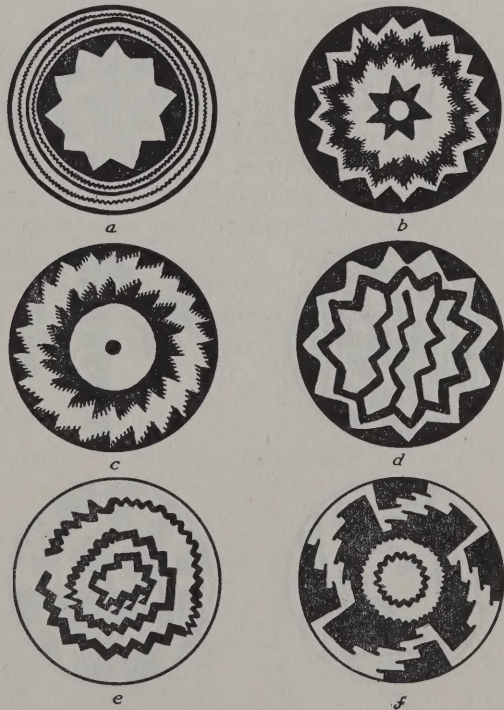


FIG. 56

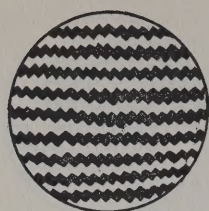
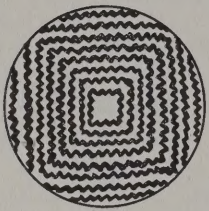
*a**b**c**d**e**f*

FIG. 57

*a**b**c**d**e**f*

FIG. 58

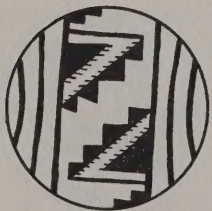
*a**b**c**d**e**f*

FIG. 59

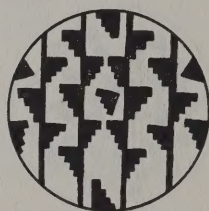
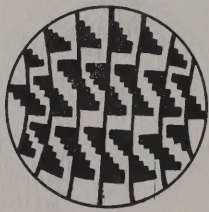
*a**b**c**d**e**f*

FIG. 60

tion (note the triangular ticks on the lower angles at the bottom of the inner circle in 56, *e*).

This element and many of the layouts in which it appears, including the spiral, seems to have been adapted from Basket Maker II basketry designs (see figs. 67; 175, *f*, *g*; particularly 67, *a*).

As in all classifications, there are certain difficulties even in this simple one. The sawtooth base lines in figures 54, *c*, *d*; 57, *c*; 102, *c*; 104, *g*; and 105, *e* are really wavy lines with triangles mounted on them. This, too, occurs on the baskets (fig. 67, *h*, *k*). Half-terrace (key) elements were sometimes similarly mounted in rows on a wavy line (fig. 56, *f*). Then, too, there are questions of limitations: at some point one substitutes zig-zag line for wavy line, as in figures 55, *c*, *d*; 57, *b*; 61, *c*; 101, *d*; 102, *j*; 105, *d*; and the heavily ticked element in figure 56, *b* is not a line at all but a broad wavy band, made up of a number of lines.

The wavy line was more preponderant than the illustrations indicate. In the figures, of course, an attempt has been made to show all designs and significant variations. They bear little relation to proportional distribution. Wavy-line elements generally had a plurality in the red-on-orange sherds in rooms and pit houses at Site 13, and occasionally a majority.

b) The second most common element is the triangle; a good second. The usual layouts were like the more popular ones for wavy lines: roughly parallel strings of triangles, with or without ticks, arranged in 3 layouts; across the bowl (figs. 57, *c*; 61, *a*; 62, *a*, *b*, *d*, *e*; 104, *g*, *h*); around the bowl in concentric circles (figs. 53, *f*; 55, *a*, *b*; 105, *a*, *c*); or, rarely, in spiral formation, from a circle in the bottom to the rim

(figs. 54, *c*; 105, *e*). Triangles appeared also in other arrangements (fig. 61, *b*); in combination with other elements (figs. 54, *d*; 55, *c*, *e*, *f*; 56, *a-d*; 58, *a-c*, *f*; 61, *c*, *d*; 62, *f*; 63, *c*, *e*; 64, *b-f*; 66, *a*, *b*, *d*, *f*; 101, *i*, *n*, *q*; 102, *c*; 104, *f*, *i*; 105, *b*, *d*, *f*, *h*, *i*; 108, *a*, *c*; 109, *a*, *b*); as a design filler (figs. 59, *a*, *d*; 61, *b*; 65, *d*; 66, *c*; 104, *j*; 108, *g*); and as a tick (figs. 56, *e*; 59, *f*; 61; 62, *b*, *c*, *e*; 105, *g*; 110, *a*). In the Abajo ware triangles were used much more extensively as ticks than in subsequent wares. Note that there are no ticks on the line of triangles at the right in figure 62, *b*, apparently because of space limitation. Also note the ticks on the tick in figure 62, *c*.

c) Terrace and half-terrace (key) figures were third in popularity. The most common layout was an arrangement of parallel strings, with or without ticks, across the bowl interior (figs. 58, *f*; 60; 101, *t*). In most cases the half terrace was used, but the full terrace was used sometimes (figs. 59, *a*; 60, *d*; 101, *t*; 104, *j*). Strings in concentric circles, the companion arrangement for wavy lines and triangles, is an awkward layout for terraces and was seldom attempted (fig. 56, *f*). However, the half terrace works better than most Abajo elements in the rarely used quadrate layout (figs. 61, *f*; 105, *g*). Half terraces and terraces also appear in combination with other elements (figs. 58, *a-e*; 63, *a*, *b*, *d*; 101, *c*; 104, *f*; 105, *b*), although they are much less important in this connection than are triangles. Their main use, aside from combination parallel layouts, is in the whirligig designs of figure 63 in the standard bifold rotational symmetry to be described under the heading, "layout," below.

The half terrace enjoyed some popularity as a filler in checkerboard patterns (figs. 65, *e*;

LEGEND FOR FIGURES 57-60

DRAWINGS OF DESIGNS ON POTTERY BOWLS FROM PUEBLO I LEVELS AT SITE 13: ware, Abajo Red-on-orange. Designs with basic motif of parallel lines across the bowl.

PROVENANCE IN SITE 13

FIG. 57		FIG. 58		FIG. 59		FIG. 60	
<i>a</i>	Room 108	<i>a</i>	Room 200	<i>a</i>	Room 296	<i>a</i>	Room 99
<i>b</i>	" 99A	<i>b</i>	" 220A	<i>b</i>	" 218A	<i>b</i>	" 99
<i>c</i>	" 100A	<i>c</i>	" 99	<i>c</i>	" 220A	<i>c</i>	" 297
<i>d</i>	" 200	<i>d</i>	" 117	<i>d</i>	" 220A	<i>d</i>	" 297
<i>e</i>	" 118	<i>e</i>	" 100A	<i>e</i>	" 105	<i>e</i>	" 240
<i>f</i>	" 221	<i>f</i>	Pit house B, floor	<i>f</i>	" 114A	<i>f</i>	" 99



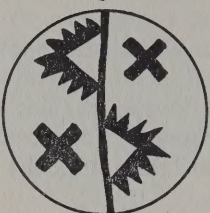
a



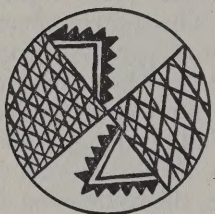
b



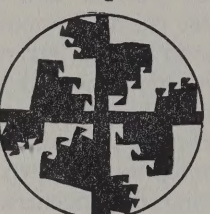
c



d



e



f

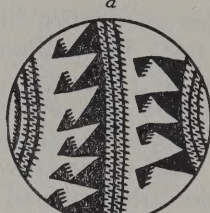
FIG. 61



a



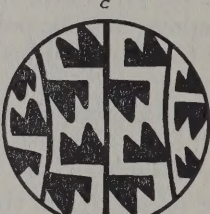
b



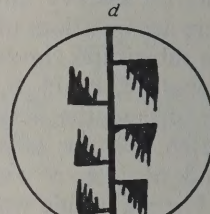
c



d

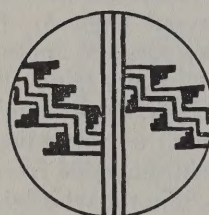


e

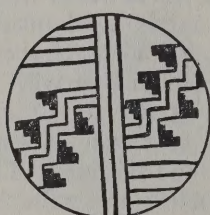


f

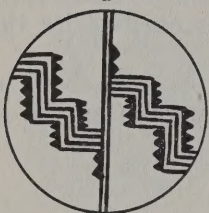
FIG. 62



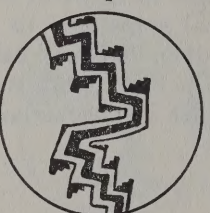
a



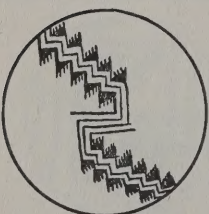
b



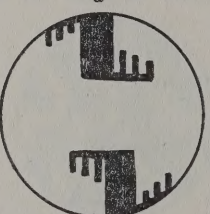
c



d

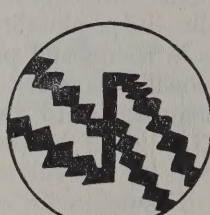


e



f

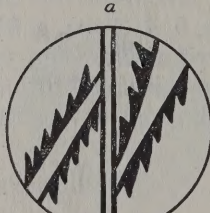
FIG. 63



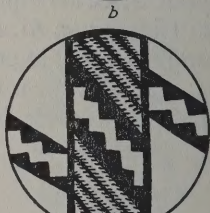
a



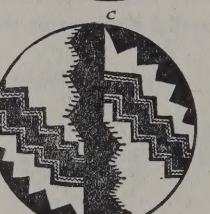
b



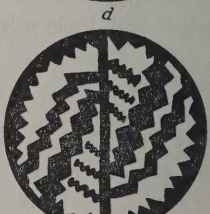
c



d



e



f

FIG. 64

102, *i*). These were sometimes carefully drawn but often quite crude. This design sometimes seems at first glance to be merely a series of parallel wavy lines crossing the checkerboard at a diagonal (fig. 102, *i*). The half terrace was sometimes used as a tick, as shown on the carrying-basket, figure 67, *c*.

d) Checks (figs. 57, *e*; 65; 101, *r*; 102, *i*; 105, *j*, *k*). This is a design hard to place in the classification I am using here. It can be considered as an element, particularly when the filler is solid (fig. 65, *a*) or as a layout. It runs fourth, well behind terraced figures, but is sufficiently common to be listed as one of the important designs.

e) Straight lines and bands. Before going on to the less common elements, we should perhaps consider the straight line. Although it appears commonly, it has not been given a rating among the important primary elements. This is perhaps an error. However, I think a respectable defense of the procedure lies in the secondary nature of this particular element. It almost always appears in combination with other elements: as extra lines (figs. 58, *a*; 59, *a*, *e*); center circle (fig. 54, *a-d*); base line for the layout (figs. 61, *a*, *b*, *d*; 62, *d-f*; 63; 64; 65; 66, *a-c*, *f*); or outline (fig. 66, *e*). Its frequency of occurrence on its own, so to speak, is such as to rank it with the less common elements below rather than with the primary elements above. In layout it follows the Abajo standards with a few specialized variations. We find straight lines across the bowl (fig. 57, *d*); zig-zag lines across the bowl (figs. 57, *b*; 61, *c*); straight lines across the bowl, arranged in a system of rectangular co-ordinates (fig. 65, *f*) and the same with a diagonal line added (fig. 61, *e*); straight lines in concentric circles (fig.

53, *a*) and concentric squares (fig. 53, *d*); and scrolls (fig. 54, *e*; 109, *b*).

f) Less important elements.

Straight Ticks, on lines or solid figures (figs. 58, *f*; 59, *e*; 62, *a-d*, *f*, with cross-line ticks also on *c*; 63, *e*, *f*; 64, *d*, *e*; 65, *c*; 101, *f*, *h*, *o*; 102, *k*, *l*, *m*; 105, *f*; 109, *c*).

Solid Dots, almost always used as design fillers (figs. 58, *f*; 101, *m*, *w*; 102, *e*; 105, *f*; 108, *e*). Note that the dots on figure 101, *w*, which is a rather unique specimen, are negative, produced by the application of some resist material.

Crosses (figs. 61, *d*; 102, *n*; 104, *k*; 108, *b*).

The treatment of design elements above was restricted to bowl designs. The bulk of the jars and all of the pitchers found were made of unpainted gray ware (figs. 99, 100). However, painted jars, bottles, and cups did occur (figs. 99, *u*, *v*, *x-jj*; 101, *d*, *g*, *k*, *l*; 102, *d*, *m*, *o*). Drawings of designs appear in figure 52. Restorable pieces and sherds indicate that preferences as to elements were probably the same as on the bowl interiors, with the wavy line first and triangles second.

LAYOUT. Design layouts on the Pueblo I red-on-orange bowls are simple and need little comment. They have been indicated in the discussion of elements, above, and are shown in the accompanying line-cuts. For the most part there is an all-over coverage of the field. The elements are relatively massive in comparison with the designs of other Pueblo potteries and the unpainted areas are small. The 2 bowls shown in figures 56, *a*, *c* and 105, *c*, and these are the largest of the restorable bowls, present the greatest unpainted areas, still not very large. The only designs to give an appreciable feeling

LEGEND FOR FIGURES 61-64

DRAWINGS OF DESIGNS ON POTTERY BOWLS FROM PUEBLO I LEVELS AT SITE 13: ware, Abajo Red-on-orange. Figures 61; 62, *e*, *f*; 63 and 64 show the typical Southwestern rotational symmetry (see pp. 269-70).

PROVENANCE IN SITE 13

FIG. 61		FIG. 62		FIG. 63		FIG. 64	
<i>a</i>	Pit House G, floor	<i>a</i>	Room 100A	<i>a</i>	Room 221	<i>a</i>	Room 86
<i>b</i>	Room 242A	<i>b</i>	" 221	<i>b</i>	" 17A	<i>b</i>	Pit House B, floor
<i>c</i>	" 297	<i>c</i>	" 99	<i>c</i>	" 100A	<i>c</i>	Room 2
<i>d</i>	Pit S. of Room 201	<i>d</i>	" 301	<i>d</i>	" 106	<i>d</i>	" 113
<i>e</i>	Room 200	<i>e</i>	" 83	<i>e</i>	" 297	<i>e</i>	Pit House C, floor
<i>f</i>	" 82A	<i>f</i>	" 250	<i>f</i>	" 100A	<i>f</i>	Room 223

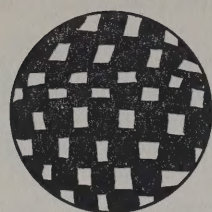
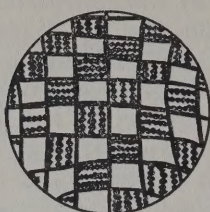
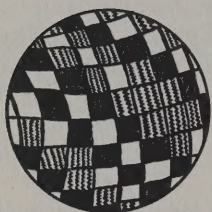
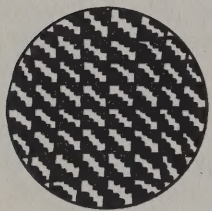
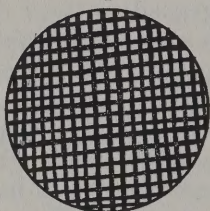
*a**b**c**d**e**f*

FIG. 65

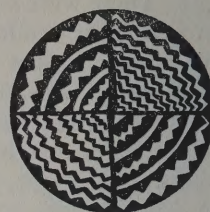
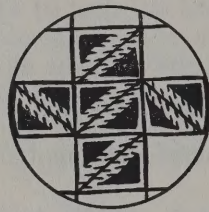
*a**b**c**d**e**f*

FIG. 66

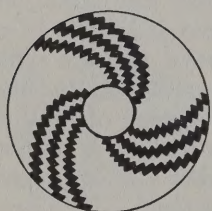
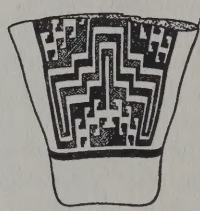
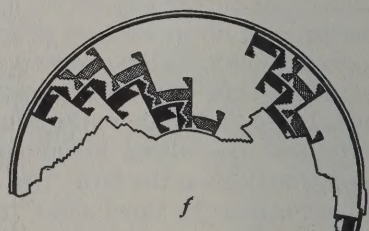
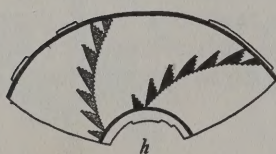
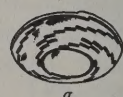
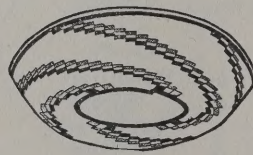
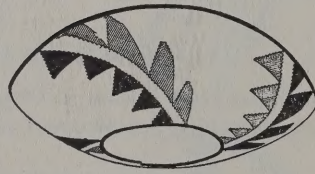
*a**b**c**e**f**h**d**g**i**j**k**l**m*

FIG. 67

FIGURES 65-67

of openness are some of the whirligigs in figures 63 and 64.

The most common layouts were 2: an arrangement of elements running across bowl interiors in roughly parallel lines following the curvature of the bowl (figs. 57-60; 61, *a*; 62, *a-e*); and an arrangement of similar elements in concentric circles around bowl interiors (figs. 53, 55, 56). More rarely, the elements spiral up to the rims from a circle in the bottom of the bowl. Comparison with basketry designs (figs. 67; 175, *f*, *g*; 191, *e*, *h*, and Morris and Burgh 1941, figs. 12-14) shows that the 2 last-named layouts were used on Basket Maker II and Basket Maker III baskets, and that the elements were similar or identical, as well.

The next most common layout is perhaps the least simple of the Abajo school. Typical examples from Site 13 are shown in figures 63 and 64. This is one of the most usual forms of rotational symmetry, characteristic of so much of Pueblo pottery design, described by Brainerd.¹⁰⁴ It is different from the other types of

symmetry in design defined and described by Brainerd—mirror symmetry, offset mirror symmetry, and radial symmetry. In rotational symmetry, if the design is revolved about the center, the original position of all the parts is reached more than once during a complete revolution. In twofold rotational symmetry that position is attained twice; in fourfold, 4 times. The way in which it works may be readily seen by tracing the designs on figure 64 and rotating the tracings over the originals. This treatment of design is very common in Pueblo art, and important because it is not common in all prehistoric American Indian art. Brainerd found it to be the least common of his symmetry types in 81 different designs on X Fine Orange pottery at Chichen Itza, Yucatan.¹⁰⁵ Another important point is that of all Brainerd's symmetry types this is the only one not found in nature. All the others are found in plants or animals or both. Thus we can be certain that this particular Pueblo design was not copied directly from plants or animals.

LEGEND FOR FIGURES 65-67

FIGS. 65, 66. DRAWINGS OF DESIGNS ON POTTERY BOWLS FROM PUEBLO I LEVELS AT SITE 13: ware, Abajo Red-on-orange.

FIG. 67. DRAWINGS OF TEXTILE DESIGNS FROM BASKET MAKER II, III BASKETS AND CLOTH BAGS, for comparison with Abajo Red-on-orange pottery designs—figs. 52-67. *m* is an Abajo pottery design. For other basket designs, see figs. 175, *f*, *g*; 191, *e*, *h*.

FIGS. 65, 66: PROVENANCE IN SITE 13

FIG. 65				FIG. 66			
<i>a</i>	Room 297	<i>d</i>	Pit House J, floor	<i>a</i>	S. of Room 81	<i>d</i>	Room 106
<i>b</i>	" 297	<i>e</i>	" " C, "	<i>b</i>	Room 218A	<i>e</i>	" 222
<i>c</i>	" 241	<i>f</i>	" " E, "	<i>c</i>	" 240A	<i>f</i>	" 226

NOTES FOR FIG. 67

a, White Dog Cave, N.E. Arizona; Basket Maker II; side view shown in Guernsey and Kidder, 1921, pl. 24, *g*.

b, *d*, *l*, are photographs of drawings in Morris and Burgh, 1941, of designs on Basket Maker II baskets.

c, *f*, *g*, *h*, *j*, *k*, also from Morris and Burgh, 1941, are basket designs attributed to Basket Maker III.

e, *i* are designs on Basket Maker II twined-woven bags (Guernsey and Kidder, 1921, pl. 26).

All basketry designs shown in this plate come from northeastern Arizona.

m is a drawing of an Abajo Red-on-orange bowl design from a Pueblo I level at Site 13, Alkali Ridge.

c, *e*, *f*, *h-k* are polychrome baskets with decoration in black and red. The red is shown by hatching. In some cases the reduction for this plate has obscured the hatching. Students interested in this feature had best go to the original publications which are referred to above. The drawings are reproduced here merely for the purpose of showing design elements and layouts.

¹⁰⁴ Brainerd, 1942; Beals, Brainerd, and Smith, 1945.

¹⁰⁵ Brainerd, 1942, p. 164.

The most usual form of bifold rotational symmetry in the Abajo ware may be described as patterns of diagonal elements going off in "whirligig" fashion from a straight line or band across the center of the bowl (figs. 58, *f*; 63, *a-c*; 64; 105, *i*). Figure 63, *d*, *e* are similar, but with a continuous design including a transverse section which performs the same function as the base line. Similar layouts are very common on Basket Maker III and Pueblo I black-on-white bowls.

Other forms of rotational symmetry are numerous on the Abajo bowls, and it may be used in any kind of layout. It is found in the spirals, and figure 54, *d* shows an example of the relatively rare trifold rotational symmetry. The fourfold type is illustrated by figures 56, *f*; 61, *f*; and 66, *a*, *e*. The bifold is the most common, found throughout the design series. In addition to the examples cited in the paragraph above it is found in figures 54, *b*, *c*; 57, *e*; 59, *b*, *c*, *e*, *f*; 61, *b-e*; 62, *e*, *f*; 65, *b*; and 66, *c*, *f*. To me the most impressive of the lot is figure 65, *b* where the variation in direction of the wavy lines in the filled squares fulfills perfectly, as a tracing will readily show, the definition of bifold rotational symmetry.

Other layouts include the all-over checkerboard pattern (fig. 65); the rare quadrate patterns (figs. 61, *e*, *f*; 66, *a*, *b*); other designs composed of 4 units (figs. 54, *e*, *f*; 66, *e*); and even rarer designs made up of more than 4 units (fig. 66, *c*, *d*).

Figure 66, *a* is an early example of a layout very similar to the offset quartered layouts of Pueblo III Tusayan country black-on-whites in northeastern Arizona,¹⁰⁶ except for the absence of the small square in the center.

Design layouts on Abajo Red-on-orange jars, bottles, cups, etc., may be seen in figure 52. Compared with the bowls this is a very limited series but it was somewhat augmented by large sherds. The extent to which the design covers the exterior of the vessel is worthy of note. It will be seen that the elements are the same as those in the bowl designs. The layouts are similar to those on the bowls, the differences for the most part apparently being adjustments to differences in size and shape. Unfortunately no whole or restorable large decorated jars with

necks were found so that it is impossible to state whether or not the necks and bodies bore different designs as in the Pueblo II black-on-whites. Two necks were recovered (fig. 52, *p*, *q*). From the evidence on hand it is possible to state that design elements and layouts used on the outsides of jars are relatively simple when compared with the whole gamut of Abajo Red-on-orange bowls.

Two unpainted orange bowls were found at Site 13 (fig. 110, *g*), hardly enough to justify a taxonomic listing of "Abajo Plain."

Three unpainted (Lino) gray bowls were found, also (fig. 110, *a-c*).

3. Pueblo I Black-on-gray (Abajo Black-on-gray). This is not in the standard Pueblo I fine-line black-on-white tradition (Kana-a, Kiatuthlanna, and Piedra Black-on-whites). It is decorated in heavy designs identical with Abajo Red-on-orange. It comprised but a very small fraction of 1% of the painted sherds in the Pueblo I levels. Only a few pieces were found, less even than the Basket Maker III black-on-whites; 2 of these are shown on the color plate (101, *u*, *v*). The true black-on-gray of this ware was apparently produced by baking the ordinary Site 13 Abajo ware in a reducing atmosphere (smothered firing). In all respects except color the pieces found are similar to Abajo Red-on-orange. Although the range in ground color is from light to dark gray, most of the pieces are medium to deep gray, in some a definite blue-gray. Figure 101, *u*, although exclusively black-on-gray on the interior, has spots of orange on the exterior, and the orange at those spots extends part way through the cross section of the paste. I succeeded in refiring black-on-gray fragments to a red-on-orange in the open flame of a Bunsen burner.

The incidence of true black-on-gray was so small that there can be no absolute conclusion as to whether it was a firing accident or an intentional variation. The difficulty of producing a reasonably even all-over gray, especially by one not habitually practising a reduction-firing technique, can be argued in favor of intent. The fact that on the red-on-orange specimens almost all of the gray firing-clouds are on the outside, and that sometimes the entire ex-

¹⁰⁶ Beals, Brainerd, and Smith, 1945, pp. 113-19.

terior is gray while the entire interior is orange, again seems to indicate that the appearance of all-over gray on the *interior* must be intentional.

As an argument on the other side, however, one can point out that many of the off-color pieces with paint in wine and plum colors have an all-over gray background, usually light (fig. 101, *s, t*), but sometimes quite dark. Perhaps a few of these were reduced too far, producing a black-on-gray, but by accident. To reverse the argument again, it may be that some of the off-color reds represent unsuccessful attempts to achieve a completely reducing atmosphere, and thereby a black-on-gray. Personally, I like to think of the possibility of potters marrying into the group from one or another of the traditional Pueblo I black-on-white areas to the east or south. It is more practical, however, to visualize local potters influenced by neighboring artisans and attempting to emulate or rival them with a distinctive gray ware of their own.

Miss Shepard (in Morris 1939) says:

In describing the firing of La Plata types, I have tried to avoid the use of the phrases "fired in reducing atmosphere" and "fired in oxidizing atmosphere," because . . . these terms are, strictly speaking, inaccurate when applied to primitive pottery. The simple, direct firing in which products of combustion of the fuel come in contact with the ware, is always necessarily reducing at the start, and the degree of oxidation obtained in the ware depends upon draft and temperature during the later stage of firing. There is in primitive firing, therefore, no possibility of obtaining uniform oxidizing or reducing conditions such as we use in the laboratory. Moreover, gray wares commonly described as being "fired in reducing atmosphere" may have been slightly oxidized at the finish, as is proved by the fact that carbonaceous matter is frequently burned out from the outer part of the vessel wall. When we consider the complex factors of clay composition, temperature, and atmosphere, which determine the effect produced on clay by firing, we recognize the fallacy of making sweeping statements based on one factor alone. To be accurate, therefore, we must describe the condition of the pottery with regard to degree of oxidation rather than attempt to generalize about the firing atmosphere maintained by the potter.

This seems to me to be an admirable summary of the situation. Since, however, the Alkali Ridge pottery has not been studied by Miss Shepard, except for a few sherds (see pp. 251-52), we do not have information about the degree of oxidation and must for the present restrict ourselves to the rather unsatisfactory generalizations about firing atmosphere, which have some virtue.

4. Pueblo I Polychrome (Abajo Polychrome). The first polychrome decoration on Alkali Ridge seems to have been achieved by adding black elements to standard red-on-orange designs. Sometimes the change consisted merely of a color shift of a few red elements to black, without affecting the layout or execution of the design (fig. 101, *c, e*). In other specimens the black element seems to represent the addition of more than just a new color (fig. 101, *d, i, j, k*). In figure 101, *j, k* the black was used as a border for the red, the standard technique of Tusayan Polychrome of Pueblo II. Figure 101, *m* perhaps should be placed with the last-named group. The color combination, however, is unique in our polychrome series. In Ridgway's color nomenclature¹⁰⁷ the unslipped ground color is Light Mouse Gray and the design is in Quaker Drab outlined with a washy Russet-Vinaceous to Vinaceous-Brown.¹⁰⁸

All of the polychrome sherds associated with the Abajo Red-on-orange are shown in figure 101. We found no restorable vessels. A large part of the jar represented by figure 101, *d* is in our collection, but a glance at another sherd from the same pot (fig. 110, *r*) will show why it was not restored. The remaining sherds were even more completely vitrified. An illustration of a whole specimen may be seen, however, in Morris, 1939, in color.¹⁰⁹

The few sherds which we do have seem to represent, for the most part, experimental stages. This is indicated not only by the varied relationships of the black to the red in the design but also by the varied nature of the black paint itself. It is obvious even to mere visual observation that the paint is not standard and that the materials used to make it must have varied considerably.

design, 46B2 or 3; outline, between 13A6 and 14A9.

¹⁰⁹ Morris, 1939, plate 1, frontispiece.

¹⁰⁷ Ridgway, 1912.

¹⁰⁸ Maerz and Paul, 1930; ground color, plate 45B1;

It is intriguing to think of these experiments as part of the development of Tusayan Polychrome and perhaps they were. The colors are in general not too dissimilar nor is Alkali Ridge too far away from the region of the seats of the major Tusayan potters for this possibility to be entertained. Discussion of this hypothesis will be found on pages 295-96.

5. **Banded Neck.** Attempts at decoration of the unpainted (Lino) ware were rare and have been described in the discussion of vessel form earlier in this chapter (pp. 247-49). The most usual was the Banded Neck (fig. 99, *p-s*; 110, *d-f, h-k*), simply achieved by refraining from obliterating the demarcations between the structural fillets¹¹⁰ in the necks of jars.

6. **Applied Neck Fillet.** Only 1 example was found (fig. 191, *d*) of a technique which may have been an imitation of Banded Neck.

7. **Applied Nodules.** Two examples of knobby unpainted vessels were found, a medium-sized restorable jar with knobs pretty much all over it (fig. 99, *n*) and a fragment of a miniature vessel on which the knobs seem to have been restricted to a row around the neck (fig. 110, *m*).

8. **Lino with Designs in Red Paint.** Three sherds from a bowl (fig. 101, *bb*) and one restorable jar (fig. 99, *ll*) were found which have typical plain ware paste but with a red design painted on. I did not make a new type for them in the taxonomic section, because they were so rare. They seem to be still-born experiments or variations resulting from the boredom of adults or the ignorance or lack of experience of children. The jar is even more peculiar than it seems at first glance, for the red design is superimposed on a design in black paint.

PUEBLO II

In many respects the pottery which followed the Abajo wares on Alkali Ridge was quite

¹¹⁰ "Fillets" is a much abused word in Southwestern ceramic writing. It is often used for lengths of clay with a circular or approximately circular cross section, whereas in all dictionaries I have consulted, the term is limited to a "narrow flat member," "thin narrow strip," etc. In the case of Pueblo I pottery, however, the term seems to apply, for the pots were built up by the addition of rings of flat, thin bands of clay, or fillets. Some, and perhaps a good deal, of the flatten-

different. New ideas are apparent and most of them probably came from elsewhere. There is, however, some continuity in both elements and layouts in the painted wares.

I have classified Sites 3, 5, 8, 9, 10, 11, and 12 as entirely Pueblo II. Sites 2 and 7 had Pueblo II levels. At Site 13, Units 2 and 4 are of Pueblo II age, and Unit 1 is considered to span the major transition between Pueblo II and Pueblo III.

In classifying the finds so, a great bulk of ceramic material has been placed in the Pueblo II period. By comparing the illustrations labeled, respectively, Pueblo I, II, and III in this report it will be seen that there is considerably more variety in pottery decoration, of both painted and unpainted wares, in the Pueblo II period than in either of the others. I am certain that such a conclusion is valid and will hold for the relationship between Pueblo I and Pueblo II, for pottery design in the former group is much more homogeneous.

I do not think, however, that the conclusion will hold for the Pueblo II-Pueblo III relationship. The Alkali Ridge Expedition's Pueblo III collections are much more limited than those of the other 2 periods. I believe that an extensive study of Mesa Verde pottery may very well reveal an even greater heterogeneity in Pueblo III times.¹¹¹

The Alkali Ridge Pueblo II pottery corresponds closely to that found by Martin at Lowry Ruin about 22 miles to the eastward;¹¹² by Reed on Mancos Creek southeast of Mesa Verde;¹¹³ and by Morris in the La Plata country.¹¹⁴ Interesting comparisons also can be made with Roberts' findings in Pueblo I and early Pueblo II sites on the Piedra farther to the eastward.¹¹⁵ If these reports are studied along with this one, the reader will obtain a fairly complete picture of present knowledge of and ideas about Pueblo II pottery in the Mesa Verde area.

As work progresses and we have more ex-

ing was done as each new ring was added to the stature of the pot, but, at least, they were fillets before their form became set.

¹¹¹ For further discussion of this point, see p. 285.

¹¹² Martin, Roys, and von Bonin, 1936; figs. 28; 29; 33; 34; 37, *c*; 38; 39.

¹¹³ Reed, 1943.

¹¹⁴ Morris, 1939, figs. 51-53; plates 259-69.

¹¹⁵ Roberts, 1930.

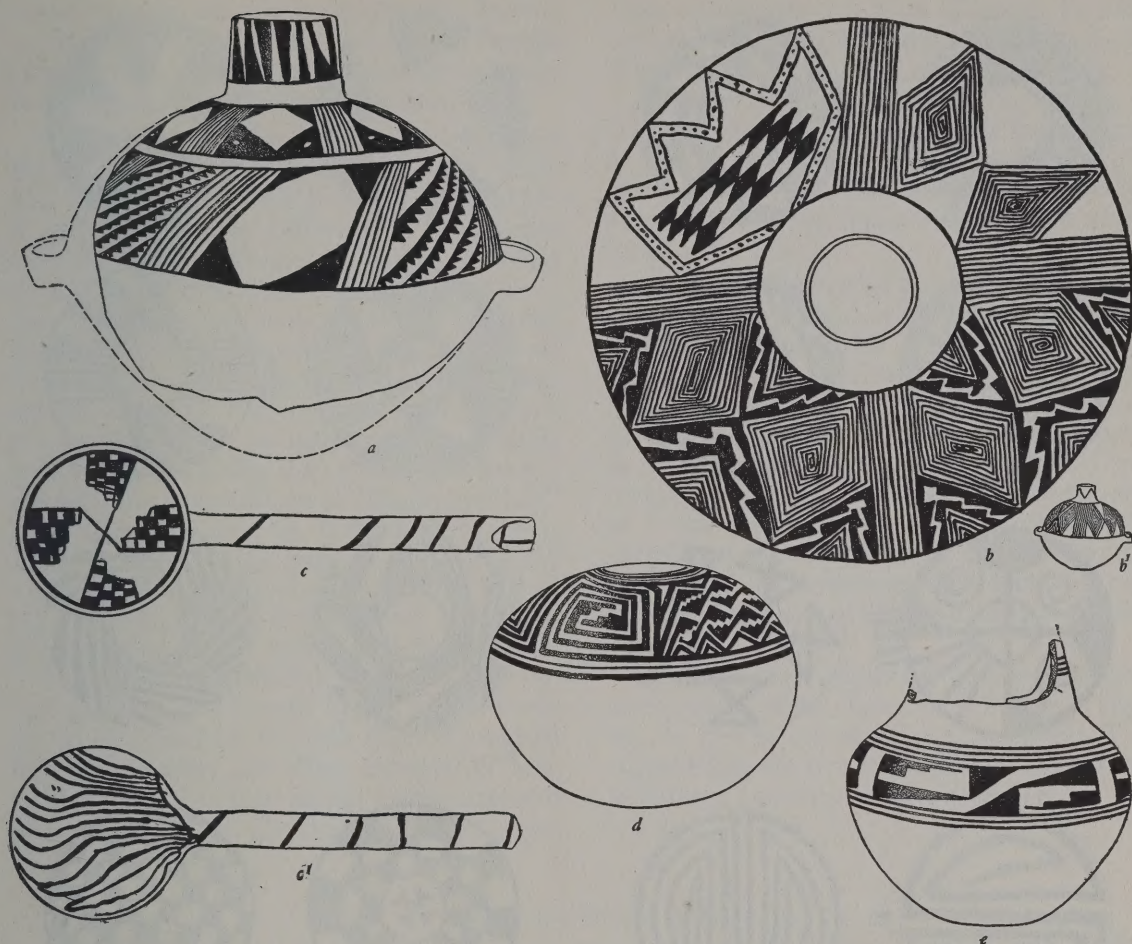


FIGURE 68

LEGEND FOR FIGURE 68

DRAWINGS OF DESIGNS ON POTTERY VESSELS FROM ALKALI RIDGE SITES: *d*, from a Pueblo III site; the rest from Pueblo II: wares, *a*, *b*, *c*, Mancos Black-on-white; *d*, Mesa Verde Black-on-white; *e*, black-on-red.

PROVENANCE

<i>a</i>	Site 8, refuse mound, Pot 3, Burial 2
<i>b</i> , <i>b'</i>	Site 11, post house, west end
<i>c</i> , <i>c'</i>	Site 5, refuse mound, Pot 7, Burial 8
<i>d</i>	Site 1, Unit 1, kiva floor
<i>e</i>	Site 7, Room B

cavation and more studies of already excavated material, we should be able to make a finer breakdown of Pueblo II, both as to area and chronology. More definite stratigraphy within the group and a good number of tree-ring dates will improve the situation greatly and will re-

sult in the change of some, at least, of our present ideas.

The general picture for Pueblo II, however, is clarifying rapidly. In fact, as I have said before, on the basis of the reports listed 2 paragraphs above and the new material presented

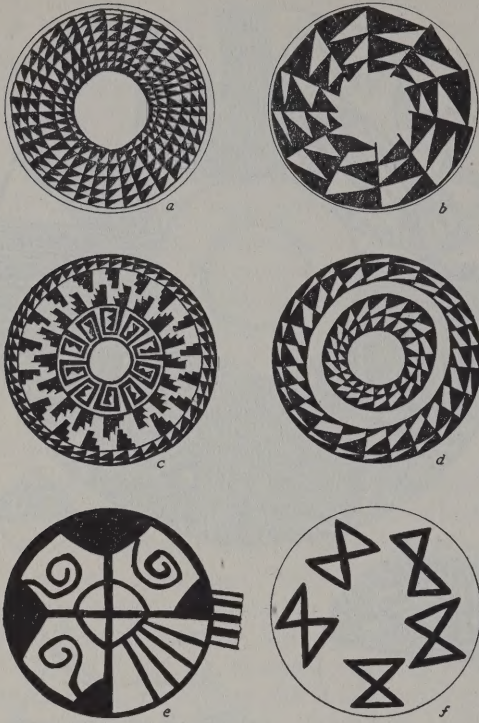


FIG. 69

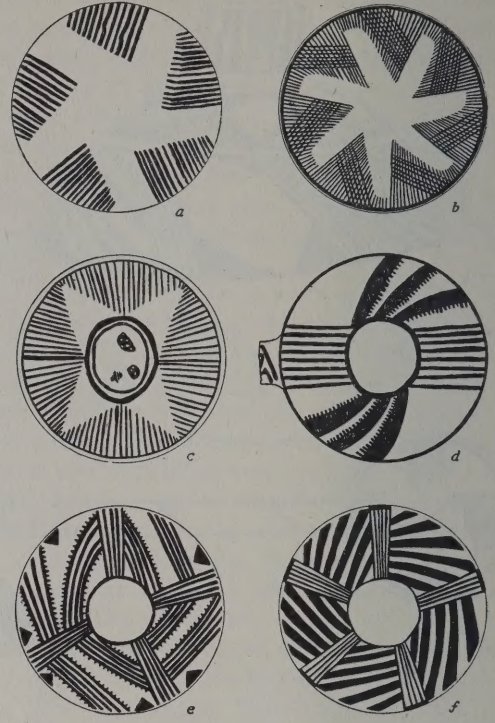


FIG. 70

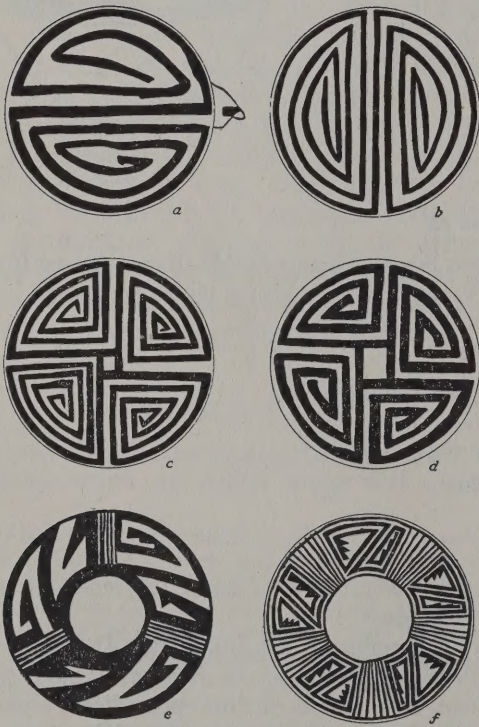


FIG. 71

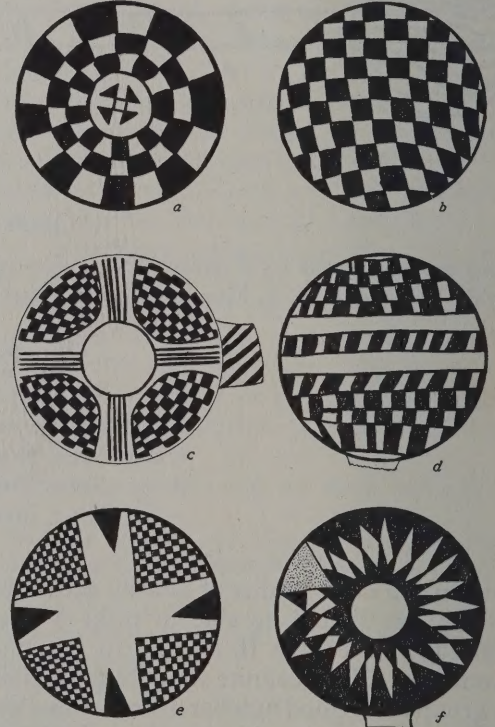


FIG. 72

herein, we can certainly say that more is known of the situation during the time we call Pueblo I and Pueblo II than of any other periods, before or after, in the Mesa Verde area.

1. Pueblo II Black-on-white (Mancos Black-on-white and Others—see p. 253). The bulk of the painted pottery in the Pueblo II sites is strikingly different in appearance from the Pueblo I Abajo wares which preceded it on Alkali Ridge. Much of this difference is due to color, arising from the almost universal use of a reducing flame in the manufacture of the later pots. The Pueblo II specimens have designs executed for the most part in dark brown, dark gray, or black paint on a light gray background slip, the combination known throughout the Southwest as "Black-on-white" (figs. 68, *a-c*; 69-73; 74, *f*; 76, *a, g*; 111-113; 114, save *k, l*; 115-142; parts of 151). The slip was still sometimes omitted on Pueblo II vessels, particularly early in the period. The background color then is usually a darker gray.

There are other differences. Most of the design elements and layouts of the earlier wares are to be found on the new black-on-whites. But the elements are often arranged in new combinations, and they appear in new sizes and new proportions so that the visual effect, espe-

cially at first glance is quite different. In addition there are layouts and elements new to Alkali Ridge.

The captions accompanying the Pueblo II collotype plates at the end of the book should be read in connection with the following discussion of design. To conserve space many points made in the captions will not be duplicated in the text.

a) The most popular element on Pueblo II painted pottery is the solid triangle. It will be found throughout the illustrations even on some of the figures primarily showing hatching. Figures 128-133 have been selected to indicate the extent of and variation in its use. It appears as the primary design, or part of it, and secondarily as a filler, in strings as a border, and as a tick on a line. It is important that the prevalence of this element be especially noted, because of the overemphasis which has customarily been placed upon hatching in the San Juan.

Note that the triangles still occasionally sport ticks, which were common in Pueblo I (figs. 131, *c*; 133, *b*; 138, *d, f-i, n*). In Pueblo II on Alkali Ridge the tick at the apex of the triangle sometimes becomes a hook (figs. 131, *e*; 133, *i, l, m*).

LEGEND FOR FIGURES 69-72

DRAWINGS OF DESIGNS ON BLACK-ON-WHITE POTTERY BOWLS FROM PUEBLO II LEVELS ON ALKALI RIDGE. Figs. 69, *e*; 70, *d*; 71, *a*; and 72, *c, d, f*, are ladles. Stipple on fig. 72, *f* indicates doubtful area.

PROVENANCE

FIG. 69

No.	SITE	LOCATION IN SITE
<i>a</i>	7	kiva fill, burial
<i>b</i>	12	refuse mound, Pot 1, Burial 1
<i>c</i>	11	post houses, west end
<i>d</i>	5	refuse mound, Pot 1, Burial 8
<i>e</i>	3	" " Burial 2
<i>f</i>	12	Room C

FIG. 71

No.	SITE	LOCATION IN SITE
<i>a</i>	5	refuse mound, Pot 6, Burial 9
<i>b</i>	5	" " , Burial 2
<i>c</i>	5	" " , " 6
<i>d</i>	11	kiva floor
<i>e</i>	3	refuse mound, Burial 4
<i>f</i>	11	post house, west end

FIG. 70

No.	SITE	LOCATION IN SITE
<i>a</i>	5	refuse mound, Pot 2, Burial 12
<i>b</i>	5	" " , Burial 4
<i>c</i>	3	" " , " 2
<i>d</i>	3	" " , " 3
<i>e</i>	5	" " , Pot 2, Burial 10
<i>f</i>	8	" " , " 4, " 1

FIG. 72

No.	SITE	LOCATION IN SITE
<i>a</i>	3	refuse mound, Burial 1
<i>b</i>	3	" " , " 4
<i>c</i>	5	" " , Pot 8, Burial 9
<i>d</i>	8	" " , " 2, " 1
<i>e</i>	7	Room B
<i>f</i>	12	refuse mound

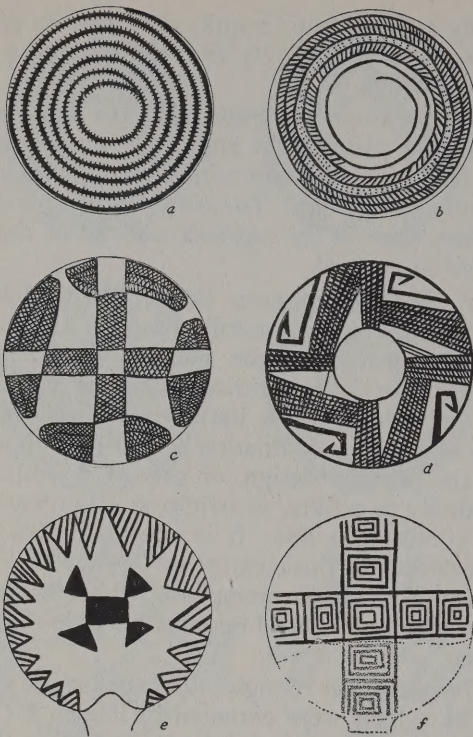


FIG. 73

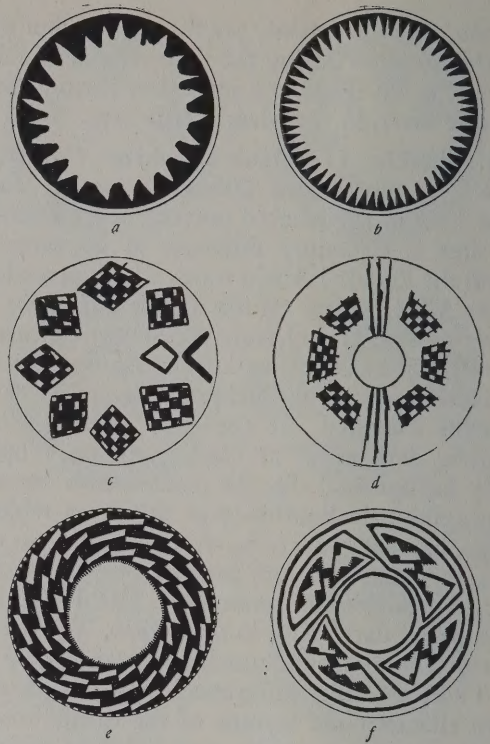


FIG. 74

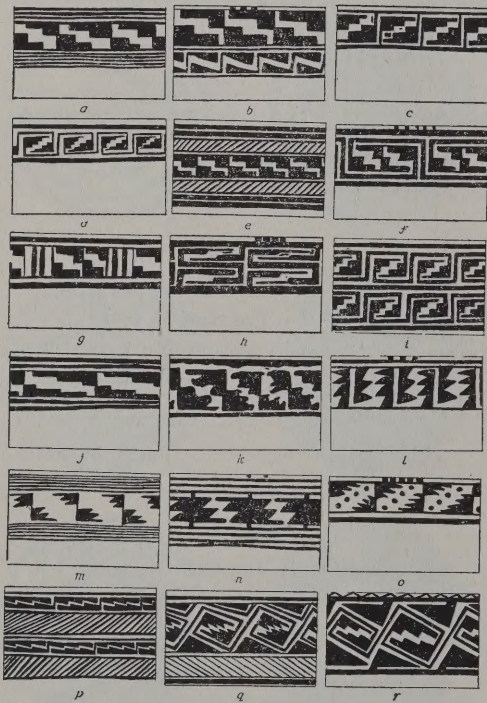


FIG. 75

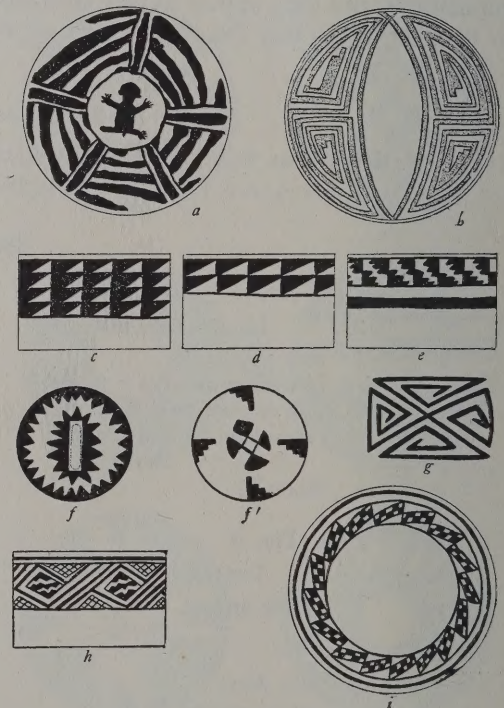


FIG. 76

There are 2 very common designs made of triangles which deserve special mention. They are very important in Pueblo II times in both the Mesa Verde and the Chaco areas but along with so many others their significance has been lost in the overemphasis of hachure. One is the design shown in figure 128 made by bisecting diagonally the squares in a basic grid of rectangular co-ordinates. Figures 69, *a* and 113, *c* show a whole specimen and figure 69, *c* shows the effective use of this design in a border. The other design is shown on sherds in fig-

ure 129 and on whole vessels in figures 69, *d*; 71, *f*; 113, *a*; 114, *e*. Although these designs are made with triangles, the usual effect on the eye is not one of triangles but of diamonds, or rhomboids or whatever the shape of the unpainted space in the pattern may be. Thus, the negative part of the design is often paramount. Many times, too, the positive part does not even look triangular (e.g., fig. 129, *c, e*). Figure 129, *b*, however, shows clearly how the result is achieved. These 2 designs are important, not only because of their prominence in Pueblo II

LEGEND FOR FIGURES 73-76

DRAWINGS OF DESIGNS ON POTTERY VESSELS FROM ALKALI RIDGE. Fig. 73: Mancos Black-on-white bowls from Pueblo II levels. *c* has a corrugated exterior. Fig. 74: Mesa Verde Black-on-white bowls from Pueblo III levels; except *f*, a northeastern Arizona Black Mesa Black-on-white (Deadmans Black-on-white [Hargrave]) bowl from Pueblo II. *a* has design on outside, similar to inside, with small triangles. *e* has an indented base; note also the typical dotted rim. Fig. 75: segments of band designs beneath rims of Mesa Verde Black-on-white bowls. Rim decoration, when present, is shown in the narrow band at the top of each design. Fig. 76: *a, b, g* from Pueblo II levels, the rest Pueblo III. *a*, a rare zoöomorphic design on a Mancos Black-on-white pot (see fig. 142 for other zoöomorphic designs). *b* is a Tusayan Polychrome, the red paint shown by stipple. *c-f', b, i*, are Mesa Verde Black-on-white designs from Pueblo III; *f, f', a* "kiva-jar" lid, vertical loop-handle indicated in center of *f*. *g* is an isolated design below the main design band on a Mancos Black-on-white jar.

PROVENANCE

FIG. 73

NO.	SITE	LOCATION IN SITE
<i>a</i>	—	Alkali Ridge, surface
<i>b</i>	12	refuse mound, Pot 4, Burial 1
<i>c</i>	7	kiva fill, burial
<i>d</i>	3	refuse mound, Pot 1, Burial 3
<i>e</i>	5	" " " 5, " 8
<i>f</i>	7	kiva fill

FIG. 75

NO.	SITE	LOCATION IN SITE
<i>a</i>	6	refuse mound
<i>b</i>	2	" "
<i>c</i>	1	Unit 1, refuse mound
<i>d</i>	1	large refuse mound
<i>e</i>	6	refuse mound
<i>f, g</i>	1	large refuse mound
<i>h</i>	6	refuse mound
<i>i</i>	13	Unit 1, kiva, top fill
<i>j-l</i>	6	refuse mound
<i>m</i>	13	Unit 1, kiva, top fill
<i>n</i>	—	hilltop site, E. of Camp 1
<i>o</i>	6	refuse mound
<i>p</i>	2	" "
<i>q, r</i>	13	Unit 3, kiva fill

FIG. 74

NO.	SITE	LOCATION IN SITE
<i>a</i>	13	Unit 3, kiva fill
<i>b</i>	2	refuse mound, Burial 1
<i>c</i>	1	large refuse mound
<i>d</i>	13	Pit House L, top fill
<i>e</i>	13	Unit 1, Room U ₂
<i>f</i>	3	refuse mound, Pot 1, Burial 2

FIG. 76

NO.	SITE	LOCATION IN SITE
<i>a</i>	5	refuse mound, Pot 3, Burial 8
<i>b</i>	5	" " " 7, " 9
<i>c</i>	13	Unit 2, kiva, below bench
<i>d</i>	2	refuse mound
<i>e</i>	13	Room 216A
<i>f, f'</i>	6	kiva fill, below bench
<i>g</i>	11	post houses, west end
<i>h</i>	1	Unit 1, kiva floor
<i>i</i>	6a	refuse mound, surface

ceramic art but also because they continue to play a strong role in Pueblo III times, as well (figs. 76, *c, d*; 79, *a-f*).

b) The most famous Pueblo II element, and one which is also a newcomer to Alkali Ridge, is fine-line hatching. Numerically it was second in importance. It occurs as simple hatching and as cross hatching. The illustrations show the technical range and the use in designs (figs. 114, *b*; 115-123; 124, *b, c*; 151, *t*).

Judging by excavation reports, museum collections, and statements of field workers, the occurrence of cross hatching is proportionally greater in the Mesa Verde area than elsewhere in the Southwest. In the Alkali Ridge sites it runs from 15 to 30% of the hachured¹¹⁶ sherds.

A few examples were found of squiggly line hatching (fig. 121) which is generally thought to be the early form and which provides a possible developmental sequence back through the wavy line of Pueblo I (figs. 53, *b*; 54, *a*; 57, *a*, etc.) to the basket designs of Basket Maker II (fig. 175, *f, g*). Comparison of figure 124, *c* with 105, *k* adds weight to this argument.

During the excavations we were greatly surprised at the almost total absence of hachured designs on the vessels found with burials when those same designs were so common on the sherds from contemporary refuse mounds, houses, and kivas. This disparity is readily apparent in a comparison of figures 69-73, 113, and 114 with the sherd plates (figs. 115-146). The whole and restorable decorated bowls are mostly from burials, and all of those found with burials are shown except one on which the design was almost obliterated (it had not been a hachure, however). Since, except for hatching, the burial bowls correspond with the rest of the sherd run, the only conclusion which seems to fit completely is that hachured pots were too common, not good enough. An alternate theory that we held for a while, that some tabu or other restriction prevented the inclusion of such vessels, seems to be vitiated by the appearance of 2 of them in burials. And the nature of those 2 seems to confirm the first

hypothesis. They are both unusual (fig. 73, *b, c*), a far cry from common hatching. The hatching on figure 73, *b* is arranged in a spiral, unique in our Alkali Ridge finds. Furthermore, it may be an import. Spiral hachured bands are characteristic of the contemporary Dogoszhi style of northeastern Arizona.¹¹⁷ Figure 73, *c*, besides bearing a highly unusual design in cross hatching, is corrugated on the outside (fig. 151, *c*). So it seems that the run-of-the-mill hatching was a good thing to eat mush out of here, but not good enough for the next world.

c) Designs using approximately parallel lines in other than typical hachured arrangement were next in popularity (figs. 68, *a, b*; 70; 76, *a*; 113, *d, e, h, k, l*; 135; 136; 151, *n*). Strangely enough this group includes a design which really corresponds closely to the dictionary definition of hatching or hachure (figs. 113, *d, e*; 135, *a-f*). Series of parallel lines were often used as partitions between panels in the standard Pueblo II circular band design layout (figs. 70, *e, f*; 71, *f*; 72, *c*).

A striking new design technique which appeared on Alkali Ridge during Pueblo II times is shown in figures 136, *b* and 151, *n*. A series of large geometric figures, circles, diamonds, etc., are set on a background of parallel lines. The figures are then filled, entirely or in part, with other parallel lines, differing in width and orientation from the lines in the background. This technique was developed further by Mesa Verde potters (fig. 80, *o-r*).

Nested triangles and squares are shown in figure 136. Figure 137 shows the triangular scroll and rectangular scroll. These may be seen in complete designs in figures 71; 113, *i, j*; 151, *t*. In the line pattern in figure 68, *b*, four of the units are rectangular scrolls and two are nested squares.

d) Fourth in popularity were the checks, of various types—square, oblong, diamond, rhombic, rhomboidal—sometimes with dots or ticks in the unpainted sections. They are shown in figures 124-126. One of the most striking

¹¹⁶ I prefer the French form of this word for the past participle. We have enough sherds in the Southwest without hatching them all over the place. I have consulted 5 independent dictionaries and found the terms to be synonymous despite the statement in the Denver Clearing House design terminology that

"hatching" is proper and "hachure" is not. As we use them they are both improper. They mean lines used for shading. Consequently our usage makes either and both a Southwestern archaeological idiom.

¹¹⁷ Beals, Brainerd, and Smith, 1945, fig. 35, *b*.

parallels with preceding Pueblo I red-on-orange design is to be found in the checks by comparing figures 124, *a* and 113, *b* with 65, *a*, and 124, *c* with 65, *b* and 105, *k*.

e) Fifth come stepped figures, half terraces and keys (figs. 69, *c*, 134). We found no example of the full terrace on a Pueblo II design. Except for the absence of the full terrace, these large solids provide possible continuity with the earlier Abajo school of design.

The other elements figured in the illustrations were less popular. Most of them appeared at all sites, but it is not felt that we obtained enough information to provide significant comparative ratings. The jagged-line all-over decoration so often found on large jars in the Kayenta region¹¹⁸ occurred in small quantities at all Pueblo II sites (figs. 112, *e*; 141, *e*). This poses an interesting problem in prehistoric trade. The most probable explanation is that these pieces were imported. Figure 112, *e* is the largest painted jar found by the expedition, but there is no reason to suppose that it couldn't have been carried up from south of the San Juan if anyone had wanted to badly enough. Or it may have been made locally by an immigrant or visitor from the south.

Scrolls are shown on figure 127; ticks on 138; dots on 139, 140, 141, *a*, *k*; zoöomorphic designs on 76, *a*, 113, *l*, 142, 147, *o*; handle designs on 145-147. Figures 141, *b* and 151, *o* are designs again reminiscent of the Pueblo I Abajo school. Figure 74, *f* is a typical Black Mesa Black-on-white Pueblo II bowl from N. E. Arizona.

LAYOUT. The layout is still fairly simple on most Pueblo II black-on-white vessels. Almost half of the whole or restorable pieces have designs enclosed in encircling bands. Usually there is just one band, but sometimes there are more, as in figure 68, *a*. The band is often broken up into panels by groups of vertical or slanted parallel lines. On bowls there were from 3 to 5 panels; on large jars, 6 to 9; on jar or pitcher necks 2 or 3.

No other layout assumed numerical prominence among the whole and restored pieces.

Four could be described as offset quadrate (figs. 71, *c*, *d*; 72, *e*; 73, *d* — the last 2 “with variations”); 1 was straight quadrate (fig. 69, *e*); 4 might be classified as miscellaneous 4-part layout (figs. 68, *c*; 70, *c*; 73, *c*, *f*); there was one 5-part layout (fig. 69, *f*, which resembles the Basket Maker III design, 52, *t*); only 2 all-over bowl layouts (fig. 72, *b*, *d*); 2 continuous line 2-part layouts (fig. 71, *a*, *b*); 3 spirals (figs. 70, *d*; 73, *a*, *b*), the first like the Pueblo I spirals; and 2 layouts which might be described as “buzz-saw” (fig. 70, *a*, *b*). As in the Abajo Pueblo I wares, many of the layouts show rotational symmetry (see p. 269). The only lunette design (fig. 76, *b*) was on a Tusayan Polychrome probably imported from northeastern Arizona where that layout was common during Pueblo II.¹¹⁹ The diaper layout, another common Arizona type,¹²⁰ occurred on only 1 restorable piece (fig. 112, *e*), also considered to have been imported.

All of the elements found on these designs are to be observed in the later Pueblo III vessels of Mesa Verde types. That the change in style was gradual was established at Unit 1, Site 13, where the shift in fashion took place during the occupancy of the unit. The intermediate “types” were characteristic of a changing style: for instance, a Mesa Verde flat, ticked rim would appear on a bowl otherwise of Mancos features; a definitely Mesa Verde narrow band, heavy figure design set-up would appear with characteristic Mancos thin wall and thin lip; or a bowl would be found with Mancos type rim, design, and lip but much thicker than usual.

2. Pueblo II Polychromes. Occasional polychrome sherds were encountered in the Pueblo II levels and 1 whole bowl was found with a burial at Site 5. The latter and most of the former are typical Tusayan Polychrome pieces. The bowl (fig. 76, *b*) has a lunette layout with an angular-S filler, one of the most common Tusayan designs.¹²¹ A selection of the sherds is shown in figure 144. They were probably all imported. (See Reed, 1944a and b.)

¹¹⁸ Roberts, 1932, plate 24, c.

¹¹⁹ Beals, Brainerd, and Smith, 1945, p. 105 and fig. 26.

¹²⁰ Beals, Brainerd, and Smith, 1945, pp. 113-17, figs. 46-48.

¹²¹ Beals, Brainerd, and Smith, 1945, pp. 105, fig. 26.

We found 6 other polychrome sherds. Four are shown in color (fig. 101, *y-aa, cc*). In figure 101, *z* the paint is standard black-on-white, but the white, instead of being an all-over slip, is merely a filler between the black lines. The third color is the unslipped gray surface of the vessel (Ridgway, Light Drab; Maerz and Paul, plate 13A₃ or 14A₃).¹²² The specimen is a rim sherd from a small jar or pitcher neck or from a straight-sided cup.

Figure 101, *y, aa* are 2 sherds from a single bowl, which had a typical straight, thin, Mancos (Chacoan) black painted rim. The black and white are again within the range of ordinary contemporaneous black-on-whites. The third color in this case is an off-gray paint (Ridgway, Pale Violet-Gray or Pale Quaker Drab; Maerz and Paul, plate 46B₂ or 3).

Figure 101, *cc* is a sherd from the midriff of a medium to large jar and has 4 colors. The decoration stops at what seems to have been the mid-point of the jar, where the curve of the wall turns to slope inwards toward the base. Below that is merely the gray color of the paste. Above that line is a design in thin gray paint, almost identical in color with that of the body clay, outlined in black, the whole on a typical white slip. The body color in Ridgway's nomenclature is between Light Mouse Gray and Quaker Drab; the gray paint is just a shade deeper. In Maerz and Paul correspondence lies somewhere between plate 46A₂ and B₅.

It is quite possible that the 4 polychrome sherds just described represent local experimentation. Excavation and sherd collecting in the region has so far failed to obtain evidence that these ideas, if they were local, ever passed the experimental stage. The Mancos Polychromes seem to have been still-born, and therefore I have not added them to the taxonomic list on table 8, page 253.

Another polychrome sherd is shown in figure 141, *d*. It may belong with the experiments discussed above. It differs from the others in that it has a brownish cast but so do a lot of the Pueblo II "Black-on-whites," particularly in the early part of the period.¹²³ The outstanding feature is that the third color is not simply a different paint but a clayey slip-like

material. This gives a gesso effect to the design. It is described in the legend notes for figure 141, so I shall merely add the color dictionary references here: in Ridgway, (a) the brown outline is between Buffy Brown and Dresden Brown; (b) the background is between Ivory Yellow and Olive Buff; (c) the filler between the brown lines is between Cartridge Buff and Pale Ochraceous Buff. In Maerz and Paul corresponding readings are: (a) between plate 14L8 and L10; (b) plate 12B₃; (c) between plates 9B₂ and 11B₂.

There is one other sherd which should be classed as a polychrome. Those who are familiar with the pottery paints of the San Juan know that different materials were used in the manufacture of the black paint, even by an individual potter. The concept of a single formula for a given period or area has succumbed before the detailed analyses of Miss Shepard. Some of the blacks came out a dark red under certain firing temperatures, a characteristic of "black-on-whites" in many parts of the Southwest. On a sherd from Site 3 we found 2 mineral paints. At the temperature in which the pot had been fired one of these came out a dull black, the other a dark red. The difference is not great but quite apparent even on a small sherd. The total effect on the whole pot must have been striking. The 2 paints were used in a formal arrangement in the design so that there can be little doubt that the result was planned and intentionally achieved.

3. Pueblo II Black-on-reds. The small number of "Black-on-red" sherds found in Pueblo II and III sites in the Mesa Verde country are usually assumed to be imports. This would seem to apply to the Tusayan Black-on-red pieces which were in the majority of those found by the Alkali Ridge Expedition. But with the discovery of a vigorous Pueblo I red-on-orange industry on the Utah mesas and of the Pueblo I La Plata Black-on-red industry in Colorado, described in Morris, 1939, it seems unwise to make a categorical assumption that no red ware was made during Pueblo II in the Mesa Verde country. Furthermore, the fact that much of the so-called "black-on-red" is really medium or dark red on lighter red or

paint tends to burn brown in a reducing fire, black in an oxidizing fire.

¹²² Ridgway, 1912; Maerz and Paul, 1930.

¹²³ Miss Shepard has discovered that manganese

pink, taken in conjunction with the Pueblo I Abajo technique of red-on-pink, seems to add weight to the possibility that the red tradition may have continued as a minor element along with the new, more fashionable black-on-white. However, if it did, no sites have yet been found in which it was very important.

4. Pueblo II Corrugated Pottery. The unpainted wares of Pueblo I bore very little decoration. Later periods in the San Juan, however, are characterized by prolific decoration on unpainted vessels, much of it very carefully worked out. The most common type was that achieved by refraining from smoothing down the exterior surface, thus leaving visible the coils of clay in the structure of the pot. This was a development of the Banded Neck technique of Pueblo I, extended to include the entire body of the vessel. It correlates with a significant change in manufacturing technique. The Pueblo II corrugated pots were made with ropes of clay laid up in a continuous spiral, whereas the Pueblo I method was to superimpose independent rings of clay. The spiral was usually started at the very bottom (figs. 154, 191, *f*). Occasionally a small dish of clay was molded first and the coil built up from that (fig. 153, *f*).

The first coils, like the earlier neck bands, were plain (fig. 150), and plain coils continued to be used as a minority type throughout the period. Early in Pueblo II, however, the idea of decorating the coils developed, and they were embellished by means of finger nail incisions (fig. 157, *j*), incisions made with a sharp tool (fig. 159, *g*), or by pinching the coils as they were being laid up. The last method produced a scalloped effect on the individual coil which when carefully arranged produced an attractive series of diagonal ridges on the body of the vessel (figs. 148, *d*; 156, *g*). The last method became the standard and its full development is shown in the Pueblo III Mesa Verde corrugated jar, figure 153, *i*.

Corrugated ware was plentiful in the Pueblo II sites. It usually exceeds the total of all others

in the sherd count. The excess may very well be due, however, to the much greater average size of the corrugated vessels rather than to an actual numerical superiority.

The situation in the early Pueblo II sites leaves no room for doubting that corrugation was new at that time. The varieties, beginning with plain, unindented coils, the frequency of crude pieces, the combinations with incising and painting techniques, all suggest a formative period during which the potter experimented with various methods of decoration, finally selecting indented corrugation as the standard. The most important of these experiments were:

a) Corrugated ware with smoothed sections upon which incised line designs occurred, figure 152, *o*.

b) Corrugated ware with incised lines over the corrugations, figures 152, *f*; 153, *c*, *b*; 158.

c) Corrugated ware with design in a narrow smoothed band crossing the coils at right angles or diagonally, figures 152, *g*; 160.

d) Pot almost wholly smoothed except for a few rows of corrugation,¹²⁴ figure 152, *n*.

e) Top half corrugated, bottom half smooth.¹²⁵

f) Corrugated more than half way down, bottom smooth.¹²⁶

g) Top half indented coils, bottom half plain coils, figures 152, *e*; 191, *f*.

h) "Alternate row groups"; series of indented, corrugated rows and series of unindented rows,¹²⁷ figures 152, *m*, *p*; 157; 159, *n*.

i) "Indentation design." A design, usually triangular, regular in occurrence around the pot, made by the use of 2 types of indentation or by indentation in the design areas and no indentation elsewhere,¹²⁸ figure 159, *b*. The last 2 types are the only ones found to continue into Pueblo III as regular styles. The others were soon abandoned. Other variations were found, as the illustrations show, but those listed above were the only ones that occurred commonly in all the sites. Attention is called, particularly, to figure 158, *i*, a sherd showing indented and unindented coils with a meandering incised line and punctate dots added. Figure

¹²⁴ Holmes, 1886, fig. 251.

¹²⁵ Roberts, 1931, plate 12, *b*; Roberts, 1932, plate 22, *e*, *f*.

¹²⁶ Nordenskiöld, 1893, plate XXI 2; Roberts, 1932, plate 22, *d*.

¹²⁷ Nordenskiöld, 1893, plate XXI 1; XXII 1; Morris, 1919a, plate 63, *a*; Kidder and Guernsey, 1919, pp. 141, 142; Roberts, 1932, plate 22, *a*, *b*.

¹²⁸ Holmes, 1886, fig. 253; Nordenskiöld, 1893, plate XXII 2.

[illegible]

TABLE 13. Corrugated ware, coil size — coil ratings.

COILS PER 4 CENTIMETERS	SITES	PERIOD
6 was 1st in	Sites 1, 2, 6, 13-1, 13-3	All P III
6 was 2nd or 3rd in	Sites 3, 5, 8, 9, 11, 12	All P II
5 was 1st in	Sites 3, 5, 7, 8, 9, 11, 12	All P II
5 was 2nd, 3rd, or 4th in	Sites 1, 2, 6, 13-1, 13-3	All P III
4 was 2nd or 3rd in	Sites 3, 5, 7, 8, 9, 12	All P II
4 was 4th or 5th in	Sites 1, 2, 6, 11, 13-1, 13-3	All P III, but one
7 was 2nd or 3rd in	Sites 1, 2, 6, 11, 13-1, 13-3	All P III, but one
7 was 4th in	Sites 3, 5, 7, 8, 9, 12	All P II
8 was 3rd or 4th in	Sites 1, 2, 6, 13-1	All P III
8 was 5th or 6th in	Sites 3, 5, 7, 8, 9, 11, 12, 13-3	All P II, but one

152, *o* shows similar techniques but with the incisions made on a wide band around the middle of a jar where the coils have been smoothed away. Figures 158, *f* and 161, *e* show coils which are not parallel. It seems to me that these examples may well indicate the extensive experimentation to be expected upon the appearance of a new technique. But on present evidence it is impossible to state whether spiral coiling originated in the San Juan or elsewhere.

It should be emphasized that despite the great variation in technique described and illustrated, most of the corrugated vessels at the Alkali Ridge Pueblo II sites were of all-over indented corrugation.

An added decoration sometimes though rarely found on Pueblo II corrugated jars, particularly small jars, is an applied clay volute (fig. 149, *i*). There are usually 2, one on either side of the jar, just under the rim.

During excavations we were increasingly impressed by an apparent difference in width of coils between Pueblo II and Pueblo III corrugated specimens. A cardboard template was made, a cut-out 4 centimeters square. Whole specimens and all sherds of sufficient size were measured; and our impression was confirmed. In all the Pueblo II sites pieces with 5 coils in 4 centimeters headed the count; in all Pueblo III sites 6 coils had the lead. And in all Pueblo II sites, except Site 11, 4 coils ran ahead of 7, while in all Pueblo III sites 7 coils ran ahead of 4. The results are so conclusive that it seems desirable in this case to present the raw data of the count.

Note that 60 of the 62 examples of 3 coils per 4 centimeters came from Pueblo II sites. Also, the only site in which 4 coils per 4 centi-

meters rated 2nd was Site 7, which according to the pottery criteria and kiva type was abandoned before Pueblo II reached its full development on Alkali Ridge.

4a. Painted Corrugation. Three sherds were found on which painted designs had been applied to a corrugated surface (fig. 151, *j*, *k*, *m*). Figure 151, *j* and *k* both had a white slip as well, so that they can be properly described as black-on-white-over-corrugation, but on *m* the black paint was applied directly to the gray surface of the pot. These are all from levels relatively early in the period and are associated with the other experimental corrugation techniques described above.

4b. Corrugated Outside, Black-on-white Inside. A relatively rare but widespread trait appearing early in Pueblo II times is the practice of leaving the coils unsmoothed on the exterior of painted bowls. When this is done the usual corrugation indentation techniques are applied as well (fig. 151, *a-b*). I have found sherds of this type as far north as Hill Creek in Uintah County, northeastern Utah. They occurred in all the Pueblo II sites on Alkali Ridge but never constituted more than a fraction of 1% of the decorated sherds. The trait survived into Pueblo III.

Figure 151, *i* is a fragment of a strange jar from Alkali Ridge which I obtained through the courtesy of Professor Elmer Smith of the University of Utah. It was part of a large black-on-white jar which had a corrugated neck.

5. Basket-molded Pottery. Another rare technique on Alkali Ridge was the making of a

pot inside a basket. The so-called Pueblo cylindrical basket was well adapted to this. The form is not really cylindrical, but the basket is tall and the walls do not slope outward very much. Nordenskiöld illustrates such a basket found on Mesa Verde.¹²⁹ We found a pot which had been made in a similar basket at Site 5 (fig. 153, *e*, *e'*). The vessel had originally been taller but the top part had been broken. The remainder was leveled off approximately and the fractured edge ground down to form a new rim.

Anthropological literature includes some rather amazing discussions of this technique, particularly with regard to the means of removing the molded but still unbaked pot from the basket. It has been called impossible, since the pot could not be got out. It has even been stated that the pot was fired *in the basket*, so that the basket was burned off, and a surprisingly uneconomic method that would be, what with the length of time it takes to make a basket. The solution is simple, and fortunately we have a published eye-witness account of the process in the Southwest. Cushing saw it done at Zuni. After the pot was molded "She then set the vessel aside *in the basket*. Within two days it shrank by drying at the rate of one inch in twelve, leaving the basket far too large (see fig. 533). It could hence be removed without the slightest difficulty."¹³⁰

The 3 other examples found in Pueblo II sites were only small sherds (figs. 151, *r*, *s* and 164, *b*). This technique continued into Pueblo III on Alkali Ridge, in fact more basket-molded sherds were found in Pueblo III sites than in Pueblo II.

Of the 3 basket-molded sherds found in Pueblo II sites, two were painted (fig. 151, *r*, *s*) on the exterior. Designs in black paint were applied over the basket-markings. All three had a white slip on the smoothed interior, and although no design was found on these small fragments, it is possible that the vessels from which they came had a black-on-white design on the inside.

6. Pueblo II Incised Pottery. Incising on Alkali Ridge pottery occurred on corrugated vessels, either across the coils or in smoothed areas between groups of coils (see p. 249).

Only 1 pot, however, was found on which incised lines are the sole decoration. The exterior surface is entirely covered by the design which consists of approximately parallel incised lines in 3 zones (fig. 152, *i*). The maximum depths of incision in all 3 zones is 1.2 millimeters. The width of incisions varies from $2/64$ to $4/64$ of an inch in the upper zone, from $3/64$ to $10/64$ in the middle zone, and from $3/128$ to $7/64$ in the lower zone. The trough profiles are V-shaped throughout the upper and lower zones; in the middle zone some are V-shaped and some are rounded. There is no regularity in trough symmetry; in some the 2 sides are symmetrical, in others asymmetrical. In size, shape, and material the vessel resembles the ordinary corrugated jars, and I believe it was made at Site 5 or nearby.

The measurements and observations of incisions in the last paragraph were made by Miss Anna O. Shepard. She believes that considerable useful information may be obtained from a study of incising techniques, particularly with regard to the handling of tools and the nature of the tools themselves. Such a study might have chronological and geographical significance, as well, particularly in regions where, unlike the Southwest, incising is a common technique. She has already observed many specimens and has made experiments with incising. Conclusions are still highly tentative, but a few can be suggested in order to indicate the possibilities. It appears that in making the incision a gouging motion tends to produce a symmetrical trough, whereas a cutting motion, as with a knife blade, more often makes an asymmetrical trough. Similarly a heel of clay at the end of an incision indicates a point rather than a knife. Irregularities such as scoring and granulations will permit further deductions. A pocket lens applied to figure 159, *i* will show, for example, a slight ridge in the trough, probably indicating a nick in the tool used. In figure 159, *l* the trough is slightly asymmetrical with a burr on the right side. All of the sherds on figure 158 were measured. Maximum depth of incision ranges from 0.6 to 1.4 mm.; width runs from $2/64$ to $6/64$ of an inch. Some other pieces were measured, including whole specimens. Range of variation is considerably greater, as would be expected, on the latter.

¹²⁹ Nordenskiöld, 1893, plate XLIV 3.

¹³⁰ Cushing, 1886, p. 501.

The shallowest maximum depth recorded is 0.5 mm. for figure 159, *k*; the deepest is 1.8 mm. for figure 153, *o*.

Figure 152, *b*, similar in size, shape, material, and texture to other early Pueblo II pieces, has a unique decoration on the top half. During the study we have called this specimen "stroked" and that seems to be as good a term for it as any.

PUEBLO III

Of the excavated sites, both units at Site 1, the concluding phase of Site 2, Site 6, and Units 1 and 3 at Site 13 have been classified as Pueblo III. In addition, collections of potsherds were made from other Pueblo III sites. These appear in the legend provenance lists as: Site 1, large refuse mound; hilltop site, E. of Camp 1; Site 6a, refuse mound; Site 6b, refuse mound. The ceramic material is illustrated in figures 68, *d*; 74, *a-e*; 75; 76, *c-f'*, *b*, *i*; 77-80; 114, *k*, *l*; 149, *m*; 151, *u*; 153, *i*; 164, *a*, *c-f*; 166-169.

1. **Black-on-white.** The sites from which surface collections were made and Unit 3 at Site 13 were full-blown Mesa Verde Pueblo III sites or something very like. The remainder of the excavated sites were early Pueblo III. Unit 1 of Site 13 is particularly interesting because, although there was only 1 3-room house with 1 kiva, the pottery was partly Mancos Black-on-white and partly Mesa Verde Black-on-white. The Mancos was technically advanced and had begun to show Mesa Verde features (see p. 199). The Mesa Verde was for the most part of the kind that could be called McElmo. However, the definitions of McElmo and the illustrated specimens labeled McElmo vary so that the safest procedure at present seems to be to call it early Mesa Verde. On most pieces mineral paint was used. One of the reasons that the taxonomic situation in the Mesa Verde area is so muddy is that people unfamiliar with the region still accept the theory that the black-on-white wares of Pueblo II and Pueblo III were done in carbon paint. Miss Shepard defines the paint on Pueblo II black-on-white in the La Plata region of Colorado as

"basically an iron oxide."¹³¹ The use of this paint continued into early Pueblo III, and I believe throughout the period, although carbon paint became increasingly fashionable. Of course, if the student makes carbon paint the determining diagnostic and refuses to classify anything as Mesa Verde that does not have carbon paint, then an entirely different result is achieved. In this connection see figure 169, *a* which, insofar as visual observation can go, seems to sport both mineral and carbon paints.

Our drawings illustrating bowl designs (figs. 75; 76, *c-e*, *b*, *i*; 77-80) are very interesting with regard to the question of the origin of the Mesa Verde style. Almost every design element in them is to be found in the drawings and collotypes illustrating Mancos Black-on-white designs. The proportional and spatial relationships between elements are very often new. But I do not have any feeling of mystery as to the source of Mesa Verde design—it comes directly out of San Juan Pueblo II.

The layout which is by far the most common on early Mesa Verde bowl interiors, an encircling band beneath the rim, was also the most popular layout in the preceding Mancos Black-on-white. The appearance is quite different because the average width of this band is much less on early Mesa Verde pieces. It widens again in late Mesa Verde.

For a long time I believed the new design treatment to be a local Mesa Verde development, but increasing acquaintance with the pottery of northeastern Arizona has given rise to serious doubts. A surprising number of the black-on-white borders of Sosi and other styles illustrated by Brainerd and Smith¹³² and attributed by them to late Pueblo II are identical in elements and layouts with our Mesa Verde designs. At present we cannot tell with any assurance which way this trait moved. My calling the designs early Pueblo III north of the San Juan does not prove that they are later than similar material labeled late Pueblo II south of the river. Furthermore, it must be realized that I have used this pottery as the major diagnostic for my Pueblo III. Morris also calls it early Pueblo III.¹³³ The much needed tree-ring dates for sites bearing this pottery in the Mesa Verde

¹³¹ Shepard, 1939, p. 273.

¹³² Beals, Brainerd, and Smith, 1945; figs. 28-31.

¹³³ Morris, 1939, fig. 55; plates 289-301.

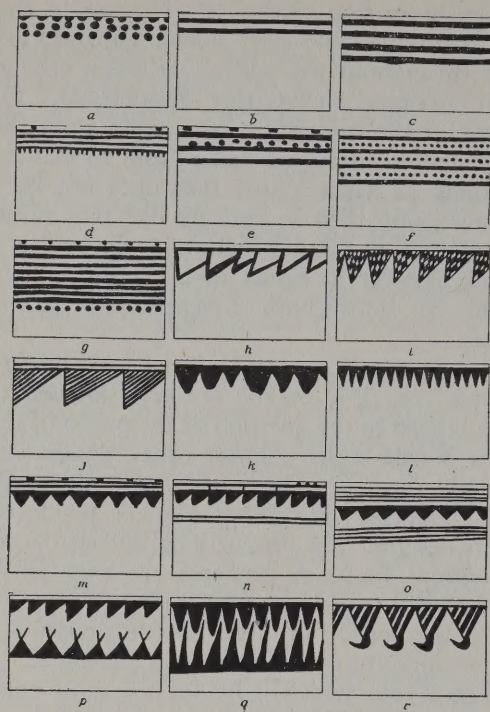


FIG. 77

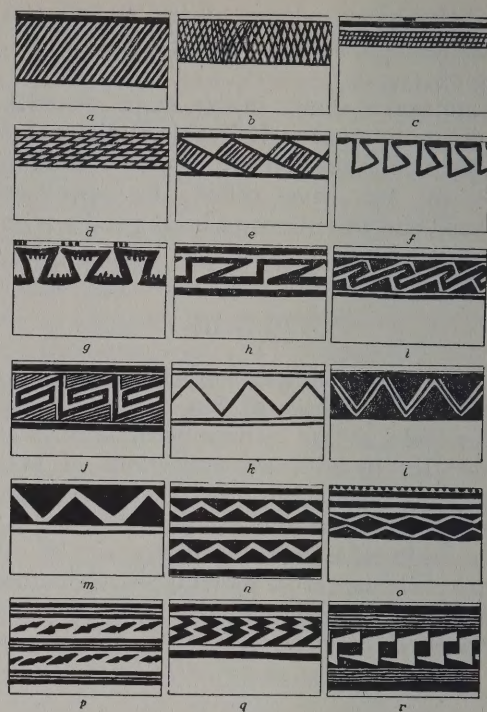


FIG. 78

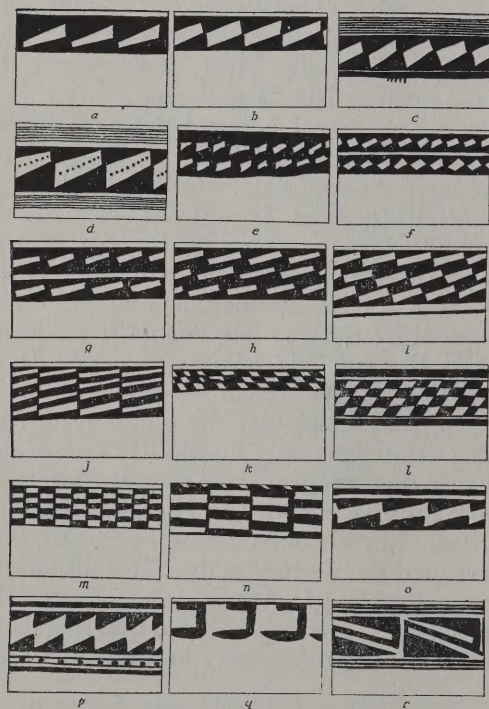


FIG. 79

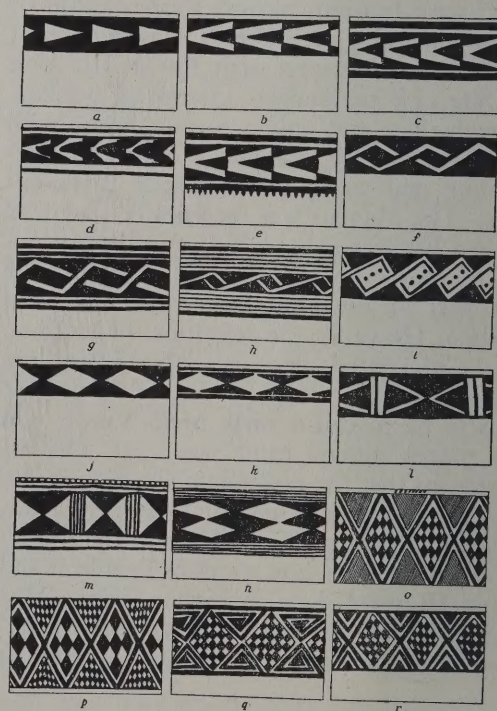


FIG. 80

region, when they are forthcoming, should help considerably with this problem. Meanwhile we must bear in mind the reasonably strong possibility that the typical early Mesa Verde layout with its angular meanders and peculiar arrangements of standard San Juan design elements may have come up pretty much intact from Marsh Pass. Whichever way it moved, Alkali Ridge was not far from the main lines of travel

between the 2 centers. And we do know that it came later than and superseded the Mancos (Chacoan) Black-on-white.

There were many more differences than merely layout between the early Mesa Verde pottery and the preceding Mancos Black-on-white. In general, the following held: (a) the vessel walls were thicker; (b) shapes were more regular; (c) rims were flat; (d) rims were not

LEGEND FOR FIGURES 77-80

DRAWINGS OF SEGMENTS OF DESIGN BANDS ON THE INTERIORS, IMMEDIATELY BELOW THE RIMS, OF MESA VERDE BLACK-ON-WHITE BOWLS FROM PUEBLO III LEVELS ON ALKALI RIDGE. Devices painted on the flat rims are shown, when present, in the narrow strip at the top of the box.

PROVENANCE

FIG. 77

No.	SITE	LOCATION IN SITE
<i>a</i>	1	large refuse mound
<i>b</i>	1	Unit 1, refuse mound
<i>c</i>	1	" 1, Room 2, floor
<i>d</i>	1	" 2, kiva, firepit
<i>e</i>	2	refuse mound, east end
<i>f</i>	6b	" "
<i>g-j</i>	6	" "
<i>k</i>	13	Unit 3, kiva fill
<i>l</i>	2	refuse mound, Burial 1
<i>m, n</i>	1	large refuse mound
<i>o</i>	12	refuse mound
<i>p</i>	5	" "
<i>q</i>	13	Unit 3, kiva fill
<i>r</i>	13	" 1, kiva, below bench

FIG. 78

No.	SITE	LOCATION IN SITE
<i>a</i>	6	refuse mound
<i>b</i>	12	" "
<i>c</i>	1	large refuse mound
<i>d</i>	—	hilltop site, E. of Camp 1
<i>e</i>	3	kiva, near floor
<i>f</i>	2	refuse mound
<i>g</i>	1	large refuse mound
<i>h</i>	6	house area
<i>i</i>	1	Unit 1, refuse mound
<i>j</i>	2	refuse mound
<i>k</i>	1	large refuse mound
<i>l</i>	13	Unit 1, kiva, top fill
<i>m</i>	1	" 1, " , near floor
<i>n</i>	1	" 1, refuse mound
<i>o</i>	—	surface, near Site 1
<i>p</i>	2	refuse mound
<i>q</i>	5	house area
<i>r</i>	13	Unit 1, kiva, top fill

FIG. 79

No.	SITE	LOCATION IN SITE
<i>a</i>	6b	refuse mound
<i>b, c</i>	1	large refuse mound
<i>d</i>	6	refuse mound
<i>e</i>	1	large refuse mound
<i>f</i>	13	Unit 1, kiva, below bench
<i>g</i>	1	" 1, refuse mound
<i>h</i>	6	refuse mound
<i>i</i>	2	" "
<i>j</i>	6	kiva floor
<i>k</i>	1	large refuse mound
<i>l</i>	6b	refuse mound
<i>m</i>	13	Unit 1, kiva, below bench
<i>n</i>	1	large refuse mound
<i>o</i>	2	refuse mound
<i>p</i>	1	large refuse mound
<i>q</i>	6	refuse mound
<i>r</i>	—	hilltop ruin, E. of Camp 1

FIG. 80

No.	SITE	LOCATION IN SITE
<i>a</i>	13	surface
<i>b-d</i>	1	large refuse mound
<i>e, f</i>	6	refuse mound
<i>g</i>	13	Unit 1, Room U ₂
<i>h</i>	6	kiva fill, below bench
<i>i</i>	13	Unit 1, kiva, top fill
<i>j</i>	6	refuse mound
<i>k</i>	13	Unit 1, kiva, top fill
<i>l</i>	13	surface
<i>m</i>	13	Unit 1, kiva floor
<i>n</i>	13	" 1, kiva, top fill
<i>o</i>	6b	refuse mound
<i>p</i>	1	large refuse mound
<i>q</i>	13	Unit 1, kiva, top fill
<i>r</i>	13	" 1, Room U ₁ , fill

painted black, the majority were unpainted with a minority decorated with intermittent groups of dots (fig. 78, *g*), and a smaller minority with continuous dots (fig. 74, *e*) which became the standard rim pattern in later Mesa Verde pottery (rim decoration, when present, is shown in the narrow band at the top of the design boxes in figs. 75–80); (e) the “white” slip was in general heavier, more homogeneous and whiter; (f) there was a greater number of vessel forms, the most famous additions being the Mesa Verde mug (figs. 151, *u*; 153, *a*, *b*; 168) and the kiva jar (figs. 76, *f*; 114, *k*; 191, *j*), among the differences between our early Mesa Verde and the early Mesa Verde of Morris, 1939, is that he lists these 2 forms only for late Mesa Verde.

As the Pueblo III style progressed the arrangement of elements become more complex, extensive use of carbon paint became fashionable, and “Classic Mesa Verde” pottery developed. This is the ware made famous by early excavations in the large cliff houses. It is the most widely known type from the region and is illustrated by figure 167, *m*. Rim decoration became much more common and also more varied (figs. 75, *r*; 79, *n*; 166, *k*).¹³⁴ Designs on the exteriors of bowls, very rare in early Mesa Verde Black-on-white, became common. Some of our sherds from the late sites bear paint on the exterior in the region immediately below the rim, but we have no pieces sufficiently large to permit the reconstruction of the design. Again we must go to Morris. He has published 56 drawings and 24 collotypes of such designs.¹³⁵

Changes took place on bowl interiors as well. The narrow design band which encircles the bowl beneath the rim in early Mesa Verde pieces broadened until it often covered the whole interior except for a small circle in the bottom. All-over designs returned to popularity, and included scrolls and offset quadrate designs.

2. Black-on-reds. Black-on-red sherds were considerably rarer, even, in the Mesa Verde sites than in the Mancos Pueblo II. And some, at least, of those found were certainly survivals. (See Reed, 1944a.)

¹³⁴ Morris, 1939, fig. 58; p. 221 presents 22 late Mesa Verde bowl rim patterns from his more extensive

3. Polychromes. The statement which has just been made for black-on-reds holds for red polychromes in the Mesa Verde sites. No local polychrome experiments were found in these sites unless the sort of thing shown in figure 169, *a* should be so classified. It is not unique, though very rare. We found enough of them, however, to establish the possibility that they were intentionally made. Seemingly mineral and carbon blacks were used to simulate Tusayan Polychrome in black-on-white. The technique, if it was a technique, was identical with the use of 2 kinds of mineral paint described under Pueblo II on page 280.

4. Mesa Verde Corrugation. The corrugated vessels were as distinctive as the black-on-whites. Coils were more regular in size and in position, indentations were more homogeneous and more often arranged in formal patterns of waves or ridges (fig. 153, *i*). Rims were thicker, had more flare, and were much deeper (figs. 149, *m*; 153, *i*). No exceptions to these rim differences were noted. Also, the exuberant corrugation of Pueblo II had disappeared. We found no examples of incising through the coils, although an occasional hold-over of this might be expected. The only customary variations of simple, all-over indented corrugation were occasional pieces of “indentation design” and alternating groups of plain and indented coils corresponding, although more carefully executed, to the Pueblo II examples shown in figures 155, *b* and 157, *c* respectively.

The average thickness of the individual coil was less, as shown in table 10, page 282.

4a. Corrugated Outside, Black-on-white Inside. Mesa Verde Black-on-white bowls are found with corrugated exteriors (fig. 151, *b*), but they seem to be much less common than in the earlier black-on-white.

5. Basket-molded Pottery. Sherds from bowls molded in baskets were found on the surfaces of all large Mesa Verde refuse mounds at which extensive sherd collections were made, and two were encountered during the excavation of the Site 6 refuse mound. Figure 164 shows 5 of them (*a*, *c-f*). All of them have

work in late sites along the La Plata.

¹³⁵ Morris, 1939, figs. 59, 60; plate 308.

black-on-white designs on the interiors. Figure 164, *a*, *c*, *e*, and *f* are Mesa Verde Black-on-whites, while *d*, although tiny, bears enough design to mark it as a Mancos survival.

In addition, figure 164, *c* and *f* were painted on the outside, over the basket marking. Figure 164, *c* has black paint on a white slip and *f* merely has black paint applied to the body of the pot. Unfortunately, the paint on *f* does not show in the illustration.

Actually, we did relatively little digging in sites with Mesa Verde pottery. Our efforts were concentrated on earlier material as presenting more pressing problems. It is obvious, however, that an extensive program of excavation in Mesa Verde sites, large and small, early and late, would yield valuable results. Then, and only then shall we be able to discuss the last 2 centuries of Mesa Verde development with reasonable assurance.

CONCLUSION

THE foregoing report can be considered as having three parts, not independent, to be sure, but parts dealing with different sorts of material and different kinds of ideas. There is the description of the work done and of the finds; there is a review of Mesa Verde archaeology and of general Southwestern archaeology in its bearings on the Mesa Verde; and there is some consideration of archaeological principle and theory which I believe to be pertinent to the present status of our studies and which I hope will prove useful, or at least interesting.

In the course of presenting all this I have occasionally tried to draw conclusions, positive or negative, mostly quite tentative, about some important and some relatively unimportant aspects of our problems. Also, I have made a definite attempt to present those problems completely, casting aside both the soft-pedal and the whitewash brush.

In final summing up I shall repeat, and add, only those conclusions which seem to me to be relatively important, and only those which can be presented without lengthy repetition of the argument. The body of the text is not particularly characterized by brevity, although many things have, actually, been treated less extensively than some readers may wish. In the latter end, then, I shall be brief.

The remaining pages will contain major conclusions, suggestions of promising lines of investigation, and a few opinions and speculations which do not appear in the text.

In writing this report I have treated the entire northern drainage of the Rio San Juan in Colorado and Utah as a culture area, particularly to mark it off from the Kayenta and Chaco areas. This is at best a generalization. It works well geographically and it works very well culturally during the Pueblo III period of the Pecos Classification. During the preceding Pueblo II period little is known of northeastern Arizona, and it is more difficult to differentiate Mesa Verde and Chaco. During the Pueblo I period ceramically at least the situation seems to be reversed, with considerable differentia-

tion even in the area which I have called Mesa Verde.

The primary aim of the Peabody Museum Southeastern Utah Expedition was to study the Pueblo II problem and, if possible, to fill the gap which existed in that part of the Pecos Classification in 1931. This aim was achieved. The material found at Alkali Ridge Sites 3, 5, 7, 8, 9, 11, 12, and some parts of 2 and 13 fulfills the requirements and can be labeled Pueblo II.

In the course of the excavations we encountered sites which forced us to expand the chronological scope of our studies to include other periods as well. As a result we present a picture of a cultural continuum, a gradual progression from the earliest agriculturalists in the San Juan to the builders of the large pueblos in the cliffs and on the mesas.

The picture does not include, at any point, the mass invasion of a new people with radically different culture. This must be emphasized. Most of the leading Southwestern archaeologists now agree that no such influx took place, but there has been little widespread publication of that opinion. At present, in 1945, articles and books are still coming from the pens of archaeologists and their colleagues in geology, geography, and botany which consider the so-called Pueblo Invasion of 700 A.D. to be an established fact. It was not so considered by the first excavators and students to note the appearance of cranial deformation in the Southwest, and it is not so considered by many of the active field men today.

Throughout this report I have called for retention of all hypotheses which the evidence supports. I can find no evidence for that invasion. Work by many investigators during the last 15 years has, it seems to me, conclusively demonstrated that evidence for it does not exist in the cultural material. The only barrier to the abandonment of the theory is the still generally held belief that a definite change took place in the physical stock of mankind in the Southwest at that time. The arguments presented in the chapter entitled "The Pueblo In-

vasion" in this report have convinced me that there is not enough evidence to justify retaining the theory on physical grounds.

In the Mesa Verde region, on the basis of cultural evidence and in terms of the Pecos Classification, the transition between the Basket Maker III and Pueblo I periods is the least likely time to postulate a great invasion. At that time changes in ceramics, tools, weapons, ornaments, and the details of architecture were coming very gradually. Sometime about then an important change took place in the appearance of the villages, but it was a logical, self-contained sort of change which, indeed, probably shows up more strikingly on our archaeological site ground plans than it did at first to a contemporary observer. The individual storage rooms, which were close together in small groups anyhow, were brought even closer together in a single structure of contiguous rooms, and characteristic Pueblo architecture was well on its way.

On the other hand, the inauguration of head-flattening must have been striking enough at the time, but I venture to say that it probably did not make so great a stir then as it did 1200 years later in the minds of early twentieth-century archaeologists.

The most conclusive evidence for cultural continuity and gradual culture change lies in the architecture. Minor and even minute changes can be traced step by step in both the subterranean rooms and the buildings at ground level. The gradual shifting of domiciliary functions can be followed from below ground to the surface as can also the increasing ceremonial specialization of the subterranean chamber.

To me, this architectural continuity is very important. Despite the inestimable value to the archaeologist of potsherds as "dating fossils," I can not but believe that the houses they lived in, the temples in which they worshipped, and the rooms in which they stored their winter's grain were more important to the Indians, loomed larger in their culture, than the bowls from which they ate their mush and the jars in which the maidens brought water from the spring.

The change in pottery, even, was not particularly impressive at the time of the sup-

posed invasion. Taking simply the diagnostic criteria of the Pecos Classification, the change in the unpainted ware (and there were many more unpainted vessels than painted ones) was very slight. The potters merely refrained from smoothing down the neck bands. That is, they stopped obliterating the lines of demarcation which, inherent as they were in the manufacturing process, were present just as much on the necks of Basket Maker III jars as on those of Pueblo I. For unpainted vessels other than jars with necks no differences are listed.

And on Alkali Ridge the change was even less than that indicated by the Pecos Scheme. Our findings show that the local potters very seldom left the bands showing on the necks of Pueblo I jars. It is, therefore, impossible to differentiate taxonomically, except for a few jars, the unpainted pottery of Basket Maker III from that of Pueblo I times.

The early unpainted wares present a real challenge. For two periods in the Pecos Classification, Basket Maker III and Pueblo I, and for somewhere between 400 and 600 years according to tree-ring associations in different parts of the Plateau, we have, taxonomically speaking, but one pottery type, *Linó Gray*. We know that the crude, relatively heavy vessels from the earliest pottery-bearing levels near Durango, Colorado, are different from the thin-walled, often finely shaped, jars of full-blown Pueblo I sites, but we cannot satisfactorily formulate these differences. Mera¹ and Hall² have made a good beginning in the Gobernador country of northern New Mexico. They have made differentiated types which they call *Rosa* (Smoothed, Brown, and Scored) to handle the unpainted pottery in the latter part of this long span, but similar studies have not as yet been applied to other parts of the San Juan.

The early painted pottery on Alkali Ridge, and in the Mesa Verde area generally, presents an entirely different set of problems. The Mesa Verde region has always been considered the purest of the black-on-white areas. Yet the earliest ware we found, as a living style, had designs in deep red mineral paint on an unslipped pink background, the pottery named *Abajo Red-on-orange*. Only a few sherds and

¹ Mera, 1935, p. 2.

² Hall, 1944, pp. 31-39.

2 restorable bowls of typical Basket Maker III black-on-white wares occurred on Alkali Ridge. This discrepancy needs explaining. The following are possibilities which must be considered:

1. That sites exist wherein such wares were the predominant style, but we failed to find them.

2. That Basket Maker III black-on-white wares were never made on Alkali Ridge. If the latter is true we have these further possibilities:

- a. There may have been no villages on Alkali Ridge when that pottery was being made elsewhere in the San Juan.

- b. People may have been living there but not making pottery or using it to any great extent.

- c. The red ware may extend back in time so that it was actually contemporary on Alkali Ridge with the manufacture of Lino and La Plata Black-on-whites elsewhere.

I have no strong convictions with regard to these possibilities. We certainly did not cover every inch of the mesa, and the probability of early black-on-white sites being eventually found seems reasonably good, especially since the meager surface evidence of such sites makes them difficult to discover. The strongest argument in favor of (c) seems to me to be the close correspondence between many of the designs on the red pottery and the designs on Basket Maker II baskets. Some slight support is added by the fact that we found the red ware *in situ* on the floors of Pit Houses H, I, and K which we have labeled Basket Maker III, typologically, and of which two underlie the contiguous storage chambers characteristic of the Abajo Phase.

Passing on to the red ware itself, we find ourselves in a most interesting coil and one which is of the essence of Southwestern archaeology for the moment, the Mogollon problem. Whether we belong there or not remains to be seen. Again, it seems to me, we should start with 2 basic possibilities:

1. That the Abajo red ware is tied up in some way with the Mogollon red wares and represents the northernmost extension of that influence, or

2. That the Abajo red ware is independent of the Mogollon. Red ware is found generally throughout the Pueblo area in later times, though often as a minority type. The fact that black-on-whites have been accepted as *the* Pueblo type of painted ware makes it easier to attribute all reds to Mogollon influence.

Certain it is that the Alkali Ridge reds do not resemble closely the Mogollons either in color or design. Both Gladwin and Haury on examining our collection have said that "it is not Mogollon."

However, there are a number of interesting possibilities which the evidence at present does not bar. If number (1) above is true and we are dealing with something connected with the Mogollon, the connection certainly is not a direct one with Mogollon Red-on-brown. To begin with, on the basis of typological associations and tree-ring dates the Abajo Red-on-orange is considerably earlier than the dating of Mogollon Red-on-brown at Mogollon village or in the Colton-Hargrave manual. The designs on Mogollon Red-on-brown show, as might be expected, considerable similarity to designs on apparently contemporary late Pueblo I (ninth century) pottery in the Mesa Verde area and to late Pueblo I and early Pueblo II red wares of northeastern Arizona (Deadmans Black-on-red, for instance). And it seems useful at this time to repeat that many of the designs on the Alkali Ridge red ware are very similar to the black and black-and-red designs on San Juan Basket Maker II and Basket Maker III baskets.

If proposition (1) above is true, that Alkali Ridge is connected in some way with developments on the Mogollon Rim, then there are a number of specific possibilities to be considered.

- a) First there is Kroeber's *stimulus diffusion*. In order to circumvent the difficulty of the absence of detailed parallels between the Mogollon ware and certain northern reds, more than one archaeologist has recently advanced the theory that the idea of red pottery might have diffused to the north even though the definite contacts of ordinary diffusion were lacking, and the San Juan had never seen a Mogollon pot. Unfortunately there is no way to obtain evidence of such a transaction, and one has to take it on faith or leave it alone. Per-

sonally I do not see the need of it here. The areas under discussion are very close together and there are no appreciable physiographic barriers between them. If their inhabitants wished to borrow and if the cultures were right for interchange of ideas there is no logical reason why considerable diffusion might not have taken place.

b) The first reasonable possibility is that the northern reds did arise through diffusion from south to north. Since the details of the wares are so different, the best argument here is that the technique of oxidizing pottery firing spread northward into an area where previously only a reducing flame had been known, but that the northerners preferred to apply or work out their own designs.

It is also possible to argue that the diffusion took place before the development of Mogollon pottery design, when only plain pottery was being made in the south—San Francisco Red and Alma Plain. Again, in such circumstances the northerners, if they wanted designs, must needs produce their own.

c) On the other hand, if events developed as suggested in the last paragraph, it then becomes possible to argue that the designs diffused from north to south and that the specific type, Mogollon Red-on-brown, is the result of a back-lash from the San Juan.

d) The question now arises, is it possible to go further and suggest that the whole business, red wares and perhaps even pottery-making itself, moved in the other direction, from north to south? The unsatisfactory nature of the Mogollon dating at present, with the disputes surrounding it, still leaves a loop-hole for such a possibility. But it seems to be only a loop-hole. The most convincing argument against it lies in the vast areas of red pottery which extend east, west, and south of the Mogollon, running, it seems highly probable, down into the Valley of Mexico and even farther. The only way in which it can be supported is by combining the possibility advanced by Morris of the invention of pottery in the San Juan with the statement often made by Gladwin that nothing has yet been found in central or northern Mexico convincingly dated as earlier than the pottery cultures of

the Southwest. Such a hypothesis seems improbable.

e) Another hypothesis should be mentioned in passing. In the event, which seems rather unlikely at present, that the Vahki Red ware of the Hohokam should eventually prove to be earlier than either of the two groups of wares we are discussing, it then becomes possible to postulate that both the San Juan reds and the Mogollon reds arose from influences from the Gila Basin by different and independent routes: the former up the Rio Verde and through the Flagstaff region, the latter up the valleys of the Gila and the Salt. Certain striking resemblances between the pottery excavated at the Dragoon sites and a few of the Alkali Ridge designs might be used in some way to support such a proposition. Fulton and Tuthill have dated Dragoon Red-on-brown considerably later than Abajo Red-on-orange so that, again, the argument as to direction of diffusion could be reversed. But dates in southern Arizona can not be considered as firmly established, and it is possible that the Dragoon sites may be earlier than at present estimated.

f) There is one other aspect of this problem which I believe can profitably be considered. It has to do primarily with architecture rather than with pottery. At Site 13 on Alkali Ridge the red pottery was found in association with a striking development in building technique. The Basket Maker III isolated slab-walled storage huts were brought together to make a multi-roomed building along with the new, ground-level living rooms. The red pottery may have antedated that event, as has been suggested elsewhere, but it is also possible to assume that the two new things appeared together. Now in the chapter on house architecture I have listed other examples of this new departure in building extending far to the south. Roberts has found it at Allantown (Whitewater), Haury has also found it at Allantown (Houck), and I have found it in the Jeddito Valley. None of these localities is far from the Mogollon Rim. The importance of this is that it establishes a contemporary line of diffusion, over and above the general similarity of Pueblo culture of the times, between Alkali Ridge and regions close

to the Mogollon. The fact that the southern examples cited are associated primarily with black-on-white pottery does not destroy the usefulness of this definite evidence of the passage of ideas along the route and at the time that we are discussing. Actually, at Jeddito Site 264 in the Hopi country north of Winslow, Arizona, we found an appreciable number of sherds of a most interesting type in terms of our problem. They can best be described as having a Lino-type paste and an all-over red paint.³ The paint is baked on. It is not the "fugitive red" applied as a wash to early northern wares after the pot had been fired. The result is a sherd which looks like the Mogollon San Francisco Red on the outside and resembles Basket Maker-Pueblo Lino Gray on the inner surface and in cross section. Haury examined these with me during one of his visits to Awatovi and, at that time, we also found a small number of sherds at Site 264 which on visual observation can be classified as San Francisco Red. The architectural tie-up does not solve our problem, since our dating is not as yet sufficiently precise to establish the direction in which the trait was moving. But it does hold bright promise of solution and it demonstrates that we shall not be forced to rest on the unsatisfactory assumption of "stimulus diffusion."

g) The "fugitive red" mentioned above provides a final item for our survey of the possibilities. This trait, which may be a manifestation of the wide-spread American Indian habit of smearing themselves and their belongings with red ochre, was very common during Basket Maker III times.^{4,5} It may represent the earliest red pottery or it may be, as has been suggested, a northern attempt to imitate the red wares of the south by potters who did not know how to produce red pottery by the use of the oxidizing flame. Again, proof must await the firmer establishment of our prehistoric dates.

So much for Alkali Ridge and the Mogollon problem. I have presented all these possibilities

because of the vital importance, at present, of this relationship or lack of it, as the case may be, to Southwestern archaeology. Any one is still a possible winner, although present odds are against some of them, and I shall not attempt to pick a favorite from the list. For, although some of my readers may not believe me after going through this report, my mind is perfectly open on the question. At times, particularly in the chapter entitled "The Present Situation" I have emphasized arguments for northern independence, especially those presented by Morris. I did so and shall continue to do so until they are proved false because I believe we have a professional obligation to consider all the possibilities. I do it with rather more gusto now than I might apply at another time because the proponents of the opposite view are the most vociferous at present and because I believe that they show a definite tendency to run ahead of the evidence.

And this has nothing to do with the theory that the Mogollon is a "basic culture" equal to or of even greater importance than either Pueblo or Hohokam. That I do not believe. Here I am merely discussing the diffusion of pottery traits, the nature of the cultural relationships between a group of wares called Mogollon and a group of wares which were made in the San Juan.

This much I will say. I do not for a moment believe in the absence of relationship and contact between the two areas at the time we are discussing. It is inconceivable to me that two such active groups with such rapidly developing and such similar cultures which were so close together geographically could be unaware of each other and of each other's pursuits. In fact I venture to state that a few weeks' work with published reports and the site survey records of the Laboratory of Anthropology, the Museum of Northern Arizona, Gila Pueblo, and the Arizona State Museum would produce on a distribution map a line of sites occupied at 700 A.D. practically within rifle shot of each other stretching from Mogollon Village and Forestdale in the south to Mancos

³To be described in the forthcoming Awatovi reports.

⁴Roberts, 1929, p. 111.

⁵"Although the practice was more generally followed in some localities than in others, no district in which instances of it are not to be observed has been reported." Morris, 1939, p. 154.

Canyon and Alkali Ridge Site 13 in the north. The exact nature of the relationship and the direction in which specific traits moved are, however, matters still to be determined. If there was, as seems probable, active diffusion, it is also probable that it was not all "one way."

Now we can turn to another important problem introduced by the Alkali Ridge red wares. The San Juan area is customarily broken up archaeologically into 3 divisions; Chaco, Mesa Verde, and Kayenta. Ceramically, Chaco and Mesa Verde are traditionally considered to be overwhelmingly black-on-white while Kayenta has a strong red cast produced by such famous wares as Deadman's Black-on-red, Tusayan Polychrome, Kayenta Polychrome, and the Tsegi reds. What, if anything, does Abajo Red-on-orange have to do with this?

At the beginning of excavations at Alkali Ridge Site 13 we noticed that the ground color of the Abajo bowls was often very similar to the unslipped ground color of Tusayan Polychrome, a standard Pueblo II pottery type in northeastern Arizona. Then as digging went on we began to find a few polychrome sherds, and these are now the earliest dated polychromes in the San Juan. The polychromes were quite different from anything we knew until one (fig. 101, j) was uncovered showing a black line forming a border for a larger red element, the traditional use of black on Tusayan polychrome. Naturally this led to speculations about the possibility that we had found in Utah the beginnings of the technique which later produced one of the most important polychrome types in Arizona, immediately to the south.

The conclusion reached is that there is a strong probability that the last statement is correct. Before discussing it further, another and related problem must be introduced. For having got so far we began to wonder if the Kayenta country red ware in general might not be connected somehow with the Abajo potteries.

Strangely enough, although the Kayenta division is noted for red wares, it seems that

during Pueblo I times red pottery was very scarce in that region. Equally strange is the fact that during these same times parts of the traditionally black-on-white Mesa Verde division were either strongly or entirely red, as far as painted pottery goes. The question of a possible connection between the early Mesa Verde reds and the subsequent development of reds in Arizona immediately arises.

In Pueblo I sites excavated in the Kayenta region and in the surface surveys red pottery is very rare, occupying about the same position that it does in Pueblo II and III times in the Mesa Verde. The first to appear is called Deadmans Black-on-red. In discussing it Brainerd and Smith say: ⁶ "Its relatively small frequency, coupled with the facts that at least part of it was tempered with dark igneous rock and that brilliantly reflecting specks appear on its surface, both unique features in pottery of this vicinity, suggest that it was imported." In their manual Colton and Hargrave state: ⁷ "This type is exceedingly common in the San Francisco Mountains, but is scarce in the Tsegi Canyons (Kayenta country), rarely more than one or two sherds being found in a site (surface) collection. Rarely have red ware sherds (of any kind) been found at Pueblo I sites in the Tsegi region." The earliest Kayenta red, then, seems to have been a trade ware drifting up from the Flagstaff region.

However, this was superseded toward the end of Pueblo I times by a red ware of quite different appearance. About this change Brainerd and Smith say: ⁸ "This pottery (Deadmans) seems to have disappeared slightly before Kana-a Black-on-white (Pueblo I) disappeared, and was replaced by a new kind of orange ware which continued, decorated in various manners, through Pueblo III. This ware has been called Tsegi Orange ware and has been subdivided into several types on the basis of the painted decoration applied to it." These types include Tusayan Black-on-red (the earliest), Tusayan Polychrome, Kayenta Polychrome, Kiet Siel Polychrome, Tsegi Black-on-orange, and Tsegi Red-on-orange.

⁶ Beals, Brainerd, and Smith, 1945, p. 125.

⁷ Colton and Hargrave, 1937, p. 72.

⁸ Beals, Brainerd, and Smith, 1945, p. 125.

Our findings on Alkali Ridge lead me to believe that the new red ware which appeared in the Kayenta country during Pueblo I times came in from the southeastern Utah mesas and canyons north of the Rio San Juan. This conclusion has already been suggested in reports of archaeologists working in the Kayenta region. Brainerd and Smith state:⁹ "... publication (of pottery excavated by the Peabody Museum of Harvard at Alkali Ridge, Utah) should shed additional light on the origins of the polychrome pottery of the Tsegi." Also, Hargrave, while with the Rainbow Bridge-Monument Valley Expedition in 1933, made sherd collections in the vicinity of Bluff City on the San Juan and visited our camp on Alkali Ridge when work on Site 13 was in progress. In his general discussion of Tsegi Orange Ware in his manual he states:¹⁰ "Many similarities in objective characters between Tsegi Orange Ware and Bluff Black-on-red indicate a genetic (sic) relationship between the two and also that Tsegi Orange Ware may be an outgrowth of a type yet to be discovered but belonging to the Bluff Series." Hargrave's Bluff Black-on-red seems to be identical with the pottery known taxonomically in the Mesa Verde area as La Plata Black-on-red, described and illustrated by Morris, Shepard, and Martin¹¹ which is the immediate successor in the Mesa Verde red series to Abajo Red-on-orange in later Pueblo I times.

This seems, at present, to be the best explanation of the Kayenta reds. Excavation in the vicinity of Bluff and along the Chinle Wash, Tyende and Laguna creeks, and Oljeto Wash should provide much valuable additional information. The hypothesis that they might have developed from Deadmans Black-on-red is the most likely alternative, but one which has not as yet appealed to archaeologists working with Kayenta material. The red paint used on Deadmans is much darker, and the light, unslipped orange to pink ground color so characteristic of Tsegi and Utah red wares seems to differentiate them from early Flagstaff reds. The Flagstaff area was heavily populated, however, and apparently very ac-

tive culturally, with important connections to the south. Part of the increasing divergence of the Kayenta region from the rest of the San Juan during Pueblo II and Pueblo III times must be attributed to influences from the villages of the San Francisco Mountains.

After the Abajo Phase of Site 13 there is a hiatus in our excavated material. The earliest black-on-white sites (3, 7, 9, 11, 12) show considerable change in most traits. In other words no level corresponding to late Pueblo I in the Pecos Classification was found on Alkali Ridge. Such material does exist in the region, however, uncovered by Martin 22 miles to the eastward¹² and by Morris farther east. Intermediate architectural developments in their ninth-century sites are described above.¹³ The La Plata red wares found in those sites seem to be direct successors to Abajo Red-on-orange. Some sherds of the latter type are found in those same sites, and the La Plata reds bear similar but somewhat developed designs, executed in black rather than in red paint, at first on the same unslipped pink ground color and then on an all-over red slip. Similar Black-on-reds are reported from the vicinity of Bluff on the San Juan, southwest of Alkali Ridge. The reds are associated with typical Pueblo I black-on-white pottery. These wares occurred only as very rare sherds in Site 13 and the early Pueblo II sites. However, since they occur both east and west of us it seems reasonable to assume for the region as a whole the continuity they provide.

This continuity, however, does not sufficiently explain the Pueblo II pottery on Alkali Ridge; black-on-whites, where none had been found before as a living pottery type; and an all-over corrugating technique, albeit still somewhat in the experimental stage, on the unpainted ware. Present evidence indicates that these came to Alkali from elsewhere. Probable sources are limited to three: (1) farther east in the Mesa Verde area (2) southeast

⁹ Beals, Brainerd, and Smith, 1945, p. 133.

¹⁰ Colton and Hargrave, 1937, p. 92.

¹¹ Morris, 1939; Shepard, 1939; Martin and Rinaldo, 1939.

¹² Twenty-two miles, air line, but 93 miles by automobile.

¹³ See pages 207-09, 219-20.

in the Chaco area (3) southwest in the Kayenta area. My feeling is that all three played a part, with two predominant streams of influence, one coming up from the Chaco into southwestern Colorado and then swinging west, the other crossing the Rio San Juan from the Kayenta region. Gladwin believes that differences between Pueblo I and Pueblo II in the San Juan were largely brought about by influences from the Little Colorado drainage. His theory could be served effectively by southern extension of the avenues suggested above. We would then have a picture of active diffusion from the Rio Puerco of the West to Chaco and beyond; from the Pueblo Colorado via the Chinle along the eastern escarpment of Black Mesa to the Bluff area; and from the Little Colorado and the San Francisco Mountains up the Jeddito, Polacca, Wepo, Oraibi, Dinnebito, and Blue Canyon washes to Kayenta and then northeast.

The general similarity in cultural detail during Pueblo II times, as shown in the archaeology of all three divisions of the San Juan, justifies giving a hearing to such sweeping claims. But, as always, it seems to me that we will be making a grave mistake if we view diffusion at that time as *all one-way* until we have the proof in hand, an eventuality which I think improbable in this case.

The changes which are indicated taxonomically by substituting a Pueblo III for a Pueblo II label in the Pecos Classification were certainly very gradual on Alkali Ridge. To all intents and purposes the standard Mesa Verde kiva form had been achieved before most archaeologists would change the label. The steps are listed in the kiva development chapter.¹⁴

The stonework of the houses improved steadily, and jacal walls, so prominent in Pueblo II times, the exclusive wall-type at Site 9 for instance, became rare, relegated to minor structures such as the turkey pen and the lean-to.

The ceramic change seems to have been gradual as well. I have considered the diagnostic point to be the shift from Mancos to

Mesa Verde design styles. We found it barely beginning at Site 5. The full transition apparently took place while Unit 1, Site 13, was in use. The elements in both styles are so similar that it is possible to present a reasonable argument that Mesa Verde design was entirely a local development on the northern mesas, and perhaps it was.

On the other hand, major developments entirely free from outside influence were probably very rare indeed in Pueblo II and Pueblo III sub-areas. The design layouts of Pueblo I (Kana-a Black-on-white)¹⁵ and Pueblo II black-on-white borders in the Kayenta area closely resemble many of the band designs on Mesa Verde bowl interiors. To me it seems quite likely that this earlier artistic tradition across the San Juan immediately to the south exerted considerable influence toward the development of the distinctive Mesa Verde style. Further excavation in the Kayenta region, and a carefully planned program of digging along the eastern and northeastern escarpments of Black Mesa, in the broad region north of Black Mesa and in the valley of the Rio San Juan in Utah will permit us to evaluate this assumption with more assurance, just as studies in the same areas will aid materially in the solution of other problems previously presented in this chapter.

The problem just discussed appears in a somewhat different light, if the beginnings of the distinctive Mesa Verde pottery designs are envisaged as going back well into Pueblo II. But the general hypothesis of probable connection with Pueblo I and Pueblo II layouts characteristic of northeastern Arizona still holds. Whenever the Mesa Verde design type may have appeared, there seems to be no reasonable doubt that it was preceded by the Mancos style. Certainly we did not find Mesa Verde designs on Alkali Ridge contemporaneous with the bulk of the sites bearing Mancos Black-on-white pottery, the sites which we have classified as Pueblo II. Yet a few Mancos Black-on-white sherds were found in all the sites bearing Mesa Verde-type pottery. Future excavators in the region should make every effort to obtain datable tree-ring material to assist in the solution of this problem.

¹⁴ See pp. 203-14.

¹⁵ Beals, Brainerd, and Smith, 1945, figs. 18-24, 28-31.

The prehistory of the Pueblo peoples in the Mesa Verde area, unlike many other parts of the Southwest, terminates with the Pueblo III period in the Pecos Classification. No sites which can be called Pueblo IV or Pueblo V have been found north of the Rio San Juan nor in the regions immediately to the south of the river. Hunting parties and families gathering pinyon nuts probably visited the northern mesas from active fourteenth-, fifteenth-, and sixteenth-century centers in the Hopi country, the Little Colorado, and the Rio Grande. We picked up 2 Jeddito Black-on-yellow potsherds on the surface on Alkali Ridge. They are indistinguishable technologically from the Pueblo IV black-on-yellow sherds found in the ruined towns of the Hopi country at the southwestern edge of Black Mesa. They were found on the mesa-top, not associated with any prehistoric site. They may have been dropped by later Utes, Navajos, or White Men. But I prefer to interpret them as traces marking the trail of roving Indians from Awatovi, Oraibi, Manuelito, Unshagi, Tyuonyi, or some other southern city.

For a long time it has been a matter of general knowledge that the Pueblo peoples did not occupy the Mesa Verde area during the final period of their prehistoric era. Yet the northern mesas of the San Juan are today as attractive as any part of the Southwest, and they support a large population of farmers and live-stock raisers. Two questions have naturally arisen from this fact. *Why was such an extensive establishment abandoned? And where did the people go?*

A number of answers to these queries have been suggested. Theories that the inhabitants were completely wiped out by pestilence or completely exterminated by warrior Utes or Navajos have received little credence. They are both possible but it is generally thought that the population was too large for total obliteration.

For some time it was believed that the occupants of the area gradually withdrew to the

fastnesses in the cliffs of Mesa Verde proper and there made a last stand against the force which was bringing about their downfall. But the more we learn about the Utah and Colorado mesas and canyons outside of Mesa Verde National Park the less likely this explanation appears.

Three theories explaining the abandonment of the Mesa Verde and the San Juan in its entirety which have gained widespread acceptance in the past will now be presented. It should be noted that all of them attribute the exodus to a single cause, although to a different one in each case. Finally a recently evolved theory will be stated, based on multiple causes, and using all of our accumulated knowledge of the prehistory and physiography of the region and of Pueblo cultural processes in general.

The first prominent theory, widely held until the publication of Dr. Douglass' studies of tree-rings, was that the Pueblos were driven out of the Mesa Verde by the increasing pressure of marauding wild tribes, presumably Utes and Navajos, who raided their fields, homes, and stores. This belief arose through combination of the obviously defensive nature of the large cliff dwellings with the conviction that the cliff houses were exclusively the last sites which had been occupied in the region.

The "wild tribes" theory was superseded by the drought theory. One of the results of Dr. Douglass' climatic studies in the Southwest was the revelation of periods of extensive drought, recorded in the tree-rings. The most famous of these, and the one which applies to our problem in the Mesa Verde, is shown in tree-rings dated by Douglass from 1276 to 1299, A.D. The excessive dryness indicated by the small amount of annual tree growth during those years marks it as a severe drought, indeed, and it has been assumed that this was the cause of the abandonment of the region. No logs have been found in the ruins dating later than 1272 A.D.¹⁶ Most of the settlements

¹⁶ Flora, 1940d. Dates of 1348 and 1374 have been assigned by Flora to wood procured from a La Plata site by Mr. and Mrs. Charles McCray. The 1348 date is from pine wood from a cradle; the 1374 dating is from a juniper log. This is one of those isolated cases which must be noted and set aside for the future. It is not unlikely that a few groups or families tried to stick it out in the San Juan. But these dates seem

rather late for that. They must be checked by further evidence. From statements in the Flora article and in footnote 15 on page 113 in Morris 1939, it seems that the site was Morris' Site 41, the largest site excavated by Morris in the La Plata Valley. In the absence of confirming evidence I can see no reason for building theories on this claim alone.

are thought to have been abandoned before that date; that is, during the period of increasing dryness before the drought reached its full intensity. This assumption of abandonment before the drought had set in for a period of successive years of extreme dryness seems to clash with the theory that drought was the only cause. It does, however, fit well with the final theory, presented in the opposite column and continued on page 300.

Another theory which has been brought to bear on this problem was not advanced to account for the abandonment of the San Juan alone but to explain the supposed decrease in population during Pueblo IV, or from the beginning of the fourteenth century onward. This is Dr. Colton's theory that the banding together of peoples into large pueblos produced epidemic diseases spread by improper sanitation so that a significant amount of the population was killed off.¹⁷ There are many things to be said against this theory. First, there is no conclusive evidence that the Pueblo population of the Southwest was smaller during Pueblo IV than in preceding centuries. It may well have been larger. The largest known Pueblo sites were occupied during this period, including the tremendous sites of the Puerco of the West, the Little Colorado, the Hopi country, the Verde, the Rio Grande, the Salinas country, and of other regions. Second, there is no conclusive evidence that the sanitation in large Pueblo towns was appreciably worse than in smaller villages. And third, there is *conclusive evidence*, of which Site 13 on Alkali Ridge is a part, that large Pueblo towns were not a recent innovation at the beginning of the fourteenth century. By that time they had been characteristic of much of the Pueblo area for at least 700 years and probably for a considerably longer period.

Recently a new theory has been advanced by Bryan¹⁸ and Hack.¹⁹ They realize that great movements of people usually, if not always, arise from more than one cause. The theory they present, supported by a rapidly growing body of evidence from many parts of the Southwest, states that there probably occurred during the latter part of the thirteenth century one of those periods of arroyo-cutting

which are characteristic of Southwestern valleys. We are in the midst of one now, in 1945. Much farm land has been abandoned because of arroyo-cutting during the last 30 years. And studies of the alluvial terraces and fills in Southwestern valleys demonstrate that this is not the first time that such a disastrous event has occurred.

I shall insert here direct quotation from Bryan's paper,²⁰ because his ideas bear so directly upon our problem, because they are so clearly expressed, and also because they are such a splendid example of the use of archaeological and anthropological evidence by a student in another field.

The effect of arroyo cutting is somewhat different from that of a mere drought. The growth of an arroyo takes place by the headward migration of falls. The steep new channel appears suddenly during a flood. It grows upstream in a chaos of fallen blocks, cliffs and minor channels. This falls section recedes a few feet or perhaps a mile each year, dependent on the number and size of the floods. As the falls move upstream, flood-water field after flood-water field becomes useless. There is, however, warning in advance and the cultivator knows that this year or at least within a few years calamity will overtake him.

This relatively slow process would be cushioned by the social organization of a Pueblo people. From our knowledge of this organization, it is possible to outline the successive steps by which a Pueblo village would react to the progressive development of this menace to its existence. The fields are divided among the matrilineal clans or family groups and cultivated by the unmarried boys and husbands of the clan sisters. If then a field is destroyed, the clan group must seek a new field, but the other clans and groups are not impoverished except by such charity as they may voluntarily bestow. The clan or group usually has other fields, and labor would be concentrated in these other fields or in new fields in the general locality. As an individual may cultivate fields as far as 30 miles from his home the choice of areas for cultivation is large. If, however, arroyo cutting were general in the area, the impoverished clan or group would probably seek relief from lands of similar groups in distant but related villages. Gradually over a term of years the clan or groups would move to the distant location.

As the arroyos grew, other groups would lose their land at intervals of one or several years. These groups in turn would seek new fields first nearby and then finally in distant areas. Each group as a

¹⁷ Colton, 1936.

¹⁸ Bryan, 1941, particularly pp. 239-42.

¹⁹ Hack, 1941.

²⁰ Bryan, 1941, pp. 240-42.

self-supporting unit of the whole community would at first be divided into those retaining the old home, and those in the new. Those remaining in the old village, carefully preserving their portion of it and utilizing its every valuable article, would finally remove to the new. Thus the deserted village would on excavation by the modern archaeologist have that neat and orderly air commented on by every observer.

That lack of rainfall was the cause of the cutting of arroyos seems on general grounds reasonable. The drought recorded in the tree rings appears to have been merely the climax of a long period of dryness. In such periods of aridity, the practice of flood-water farming has many advantages. Even small rains properly spaced afford good crops. The probable response of the Pueblo communities to a prolonged series of dry years would be to plant more fields at great distances apart so as to increase the chance of fortunate rains. But if a general period of arroyo-cutting accompanies a period of drought, the sites of fields would be destroyed and migration would be forced. The effect of arroyo-cutting on agriculture is, however, much more severe in some localities than in others. The canyons of the Plateau area have relatively narrow flood plains built-up of relatively clayey alluvium. Here the cutting of an arroyo is completed rapidly and nearly all the available farming land destroyed. Such a locality is Chaco Canyon where, in its present state of dissection, even the side canyons are ruined and no longer valuable.

The Hopi country is a remarkable exception within the Plateau area. Here the prevalence of wind-blown sand inhibits complete dissection. In the present cycle of dissection many minor streams are unaffected, and their flood-plains are available for farming. Furthermore, sand dune agriculture is important and Hack²¹ has demonstrated that there was little damage in the area of available farmland in periods of dissection.

In the Rio Grande area, the diversion of living water for irrigation is possible at many localities. Apparently this type of farming was practiced increasingly in the later periods of Pueblo life. Even in this region flood water farming was important; for the Tano people could have farmed no other way in their homeland in the drainage of the Rio Galisteo.²²

The great migrations of 1300 to 1400 A.D. are thus explained by the synchronous period of erosion, which was presumably induced by a climatic swing to dryer conditions. This fluctuation toward the dry appears to have reached its climax in the great drought of the later part of the thirteenth century. The response of the Pueblo to climatic stress is not obvious in the

archaeological record. The response to the cutting of arroyos and the loss of flood water fields was a complex phenomenon in which the social structure of the Pueblos played a role in mitigating the immediate effect. Their village communities were, however, forced into new areas and into a more extensive use of living water as a means of irrigation. These changes we now perceive but vaguely. In the future, assuming the present rate of archaeological progress, we will know what each community did, where it went, and will have a depth of understanding, now denied us, of the response of man to a changing world.

So here is another theory, and furthermore one that strikes at the very source of life for an agricultural people, the land. It is of great value at present, for we can now begin to work it and all the other theories effectively together.

Let us suppose that it was true, and there are no good reasons why it could not be, that the pressure of the "wild tribes" was increasing. However, as both Bryan and Morris have recently argued quite convincingly,²³ the military ability of nomadic tribes to maintain effective long sieges may well be questioned, and it seems hardly probable that guerilla warfare alone would force a population, with at least 1,000 years of tradition and accomplishment behind it, out of its homeland.

If, however, we can visualize this ever-increasing pressure of the guerilla bands correlated with year after year of drought, and correlated with increasingly rapid cutting back of the arroyos and the annual loss, thereby, of hundreds of acres of farm land, then it seems to me we can also visualize a group of men and women getting together and deciding that the country and its traditions are not worth fighting for longer, that everything is against them, and that they had best move down into the Rio Grande or to those parts of the Little Colorado drainage where there is always some water and where they would be farther away from the Utes.

The theory developed by Bryan and Hack primarily from work and observations outside the Mesa Verde can be applied to that area only by inference pending the study there of the history of the valley fills.²⁴ However, it

about by intrenching of the Mancos River in connection with a phase of arroyo-cutting believed to have occurred at that time is suggested by the occurrence of pueblo sites only on the second terrace of the valley floor."

²¹ Hack, 1941.

²² Nelson, 1914.

²³ Morris, 1939, p. 43; Bryan, 1941.

²⁴ One small item of evidence is provided in Reed, 1943. "That the abandonment of the area — probably at the end of the thirteenth century — was brought

does provide, in combination with the other factor of the marauding tribes, a reasonable explanation for the mysterious abandonment of a seemingly attractive farming country by its agricultural inhabitants.

That the abandonment occurred toward the end of the thirteenth century seems assured. The fourteenth century date claimed for the La Plata has already been mentioned.²⁵ If the dating of those pieces is correct, an eventuality I believe unlikely in this particular case, it merely indicates that a few isolated survivors may have remained behind for a while in the more favored locations, a phenomenon naturally to be expected. The rainfall in the vicinity of Durango, for instance, is well above the average for the region as a whole, and one might well find evidence of a few die-hards there. Isolated instances of this kind may eventually turn up. But most of the Pueblos had gone.

Explanations of the exodus of Pueblo peoples from the Mesa Verde region have now been presented. The question remains, *where did they go?*

Evidence of the new homes is limited and, such as it is, insufficiently analyzed. Since the work of the Peabody Museum Southeastern Utah Expedition dealt only with the early life of the Pueblo Indians on the Utah mesas, a detailed study of the problem is outside the scope of this report. I am merely attempting in conclusion to present in brief form the total picture of their use of the area as I see it now. That picture naturally includes routes of emigration and the eventual locations of the emigrants.

Evidence seems to indicate that when they left they did not go by any one route or in any one general direction. The likelihood of such being the case is increased if we visualize, as has been suggested above, people departing from a large area in Utah and Colorado, not merely from a final refuge in the canyons of Mesa Verde National Park.

There is no evidence that they went due east, due west, or north. All known subsequent Pueblo sites are to the south. To the south,

then, they went, leaving their homeland to Navajo and Ute.

The most natural supposition would seem to be that those in Utah moved south into Arizona and that those in Colorado moved south into New Mexico. We know from trade objects found in the sites that occupants of the area in Pueblo III times had contacts with the Kayenta peoples of Arizona and the Chaco peoples of New Mexico. The main contacts with the former would be at the southern ends of the Utah mesas and across the Rio San Juan; with the latter down the Mancos, La Plata, and Animas rivers into what is now San Juan County, New Mexico.

It is also natural to suppose that the contact included intermarriages along these same routes, so that the necessary blood-relatives would be present to receive and grant appeals for asylum and fields to till.

Evidence for this point of view is to be found in both the east and the west. The work of Morris at the site of Aztec on the Animas in New Mexico has presented a picture of Mesa Verde people occupying former Chaco lands in that region.²⁶ Evidence exists also for movements farther to the southeast as the Chaco, too, was gradually abandoned. Marked similarities to Mesa Verde style in pottery designs in the drainages of the Rio Grande and the Pecos suggest that they went on with their Chaco relatives to those regions of permanent watercourses.²⁷

Although events in the east are not at all clear, as yet, the situation in the west is even more foggy. Statements have been made about Mesa Verde-like pottery in northeastern Arizona. The opinion that Mesa Verde people went that way has been current for some time. It may arise partly from the resemblances in wares of an earlier date mentioned above,²⁸ but much of it seems to refer to late Pueblo III.

Along the Jeddito Wash in the Hopi country at the southwestern edge of Black Mesa I found pottery closely resembling Mesa Verde Black-on-white. It occurred in Pueblo III sites dated by tree-rings in the last half of the thirteenth century, and also in the early Pueblo IV level at Awatovi in association with Jeddito Black-on-orange. Design elements and

²⁵ See footnote 16, p. 298.

²⁶ Morris, 1919b, 1928.

²⁷ Amsden, 1931.

²⁸ See p. 297.

layouts were strikingly similar, and the famous Mesa Verde mug form (fig. 153, *a*, *b*) was present. Only the relative crudity of painting and vessel shaping prevented the classification of these as Mesa Verde Black-on-white on sight.

Mesa Verde-like pottery is also reported specifically in an intermediate region, the northeastern edge of Black Mesa, along the Chinle and the creeks which drain into the Tyende, and in Monument Valley. The Rainbow Bridge-Monument Valley Expedition collected sherds of Mesa Verde character throughout that area. Watson Smith states: "I am of the personal opinion that in Pueblo III some kind of influence from the Mesa Verde region worked over to Black Mesa and may have got tangled up with the southward-moving people from the Kayenta region during the general exodus from the San Juan."²⁹ And here, for the third time in these conclusions, I find myself emphasizing the need for intensive work along the northeastern rim of Black Mesa and in the area between there and the Rio San Juan.

With the plea in the last sentence I reach the final subject to be considered, the future. Much more excavation is needed in the Mesa Verde region, including Mesa Verde proper, and in other areas where information valuable to the Mesa Verde may be obtained.

Within the area itself any scientifically conducted program will produce a large amount of useful results. But the present state of our knowledge provides a number of specific sub-areas and general problems about which we need information now. Recommendations have already been made on page 31. I shall repeat three of them here and add a few more.

Excavations should be planned to provide material for studies of the geographical and chronological distribution of traits within the region. We are in especial need of a detailed knowledge of divergences between east and west, from the Piedra to the Rio Colorado.

Excavations should be made in Basket Maker II sites. All that we have at present is specimens from such sites.

²⁹ Personal memorandum.

We are also in great need of intensive scientific excavation of large Pueblo III sites both in the caves and on the mesa-tops. Previous digging in and clearing out of late sites has not provided the sort of information we want. This demand calls for major projects and expensive ones, but efforts and money so invested will be well repaid.

We need more tree-ring dates, particularly in small-house sites. These can be obtained relatively inexpensively. A limited program based on a careful selection of sites by surface indications might go far in a single season toward clearing the haze which still blankets the use of the Unit-type house in Pueblo II and Pueblo III times.

We need much more excavation along the southern border, particularly along the Rio San Juan in Utah.

And this brings us again to northeastern Arizona and, for the fourth time, to the northern escarpment of Black Mesa and the low country it dominates.

From there we can profitably move south to the Rio Pueblo Colorado, a direct route, dotted with sites, to the Little Colorado and the Rio Puerco of the West.

Excavation along the main line of the Santa Fe Railroad, from Grants, New Mexico, on the east to Winslow, Arizona, on the west will supplement the work of Roberts and Haury at Allantown and should give us the detailed information and the dates essential to the evaluation of relationships between the communities in the San Juan and those along the Mogollon Rim. Sites of any and all periods are important here. Dating by decades of pit house traits and pottery traits and of the time of appearance of the first contiguous storage rooms in a belt 75 miles wide across this region, if obtainable, would be invaluable. At the other end of the time-scale, I hope to live to see the excavation of Manuelito in the Valley of the Puerco of the West, one of the many sites distinguished as "the biggest in the Southwest."

And if there is anyone who still thinks that "the Southwest is exhausted as a field for archaeological research," let him again move south a few miles, this time to the Mogollon Rim.

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APPENDICES

APPENDIX A
TABLES A-I — A-IV
ALKALI RIDGE SKELETAL MATERIAL
MEASUREMENTS, INDICES, AND OBSERVATIONS

BY ALICE BRUES

ILLUSTRATIONS: FIGURES 190-192

Numbers in the tables in Appendix A refer to burials described in the text as follows:

N/915 — Site 4	N/920 — Site 12, Burial 3	N/926 — Site 5, Burial 7	N/931 — Site 5, Burial 12
N/917 — Site 8, Burial 1	N/921 — Site 5, Burial 1	N/928 — Site 5, Burial 9	N/932 — Site 13, Pit House D
N/918 — Site 8, Burial 2	N/922 — Site 5, Burial 2	N/929 — Site 5, Burial 10	N/933 — Site 13, Unit 3, Skeleton 1
N/919 — Site 12, Burial 1	N/925 — Site 5, Burial 6	N/930 — Site 5, Burial 11	N/934 — Site 13, Unit 3, Skeleton 2

	N/ 915	N/ 917	N/ 925	N/ 928	N/ 929	N/ 931	N/ 932	N/ 933	N/ 934
Humerus Shaft Shape R.	plano-convex	..	..	plano-convex	trapezoid	plano-convex	plano-convex	plano-convex	trapezoid
Humerus Shaft Shape L.	"	..	plano-convex	"	"	"	"	"	"
Perf. Olecranon Fossa R.	pres	..	abs	abs	pres	abs	abs	abs	abs
Perf. Olecranon Fossa L.	abs	..	abs	abs	pres	abs	pres	abs	abs
Supracondyloid Process R.	abs	..	abs	abs	abs	abs	abs	trace	abs
Supracondyloid Process L.	abs	..	abs	abs	abs	abs	abs	abs	abs
Humerus Maximum L. R.	..	..	283	297	297	304	314	335	288
Humerus Maximum L. L.	..	..	281	293	296	310	312	341	290
H. Maximum Middle Diam. R.	19	..	..	22	21	22	21	21	22
H. Maximum Middle Diam. L.	19	..	23	20	19	21	20	20	21
H. Minimum Middle Diam. R.	15	..	..	17	14	18	17	17	18
H. Minimum Middle Diam. L.	16	..	16	16	14	17	16	16	17
H. Maximum Diam. Head R.	..	..	41	45	39	43	40	47	42
H. Maximum Diam. Head L.	..	..	42	43	39	42	40	47	41
Middle Index R.	79.0	..	..	77.3	66.7	81.8	80.1	80.1	81.8
Middle Index L.	84.2	..	69.6	80.0	73.7	80.1	80.0	80.0	80.1
Humero-Femoral Index R.	..	..	72.4	..	75.0	..	75.3	71.0	71.3
Humero-Femoral Index L.	..	..	71.5	..	73.6	70.1	74.5	71.8	72.1
Radius Bowing R.	abs	..	med	..	sm	sm	sm	sm	sm
Radius Bowing L.	sm	..	med	med	sm	sm	med	sm	sm
Radius Shaft Shape R.	prism	..	prism	..	prism	prism	prism	prism	prism
Radius Shaft Shape L.	prism	..	prism	prism	prism	prism	prism	prism	prism
Interosseous Crest R.	sm	..	med	..	pp	sm	med	sm	pp
Interosseous Crest L.	sm	..	med	med	med	med	med	sm	med
Radius Max. Length R.	..	..	226	..	..	250	248	..	237
Radius Max. Length L.	..	..	..	230	245	247	247	267	233
Humero-Radial Index R.	..	..	79.8	..	..	82.2	78.5	..	82.3
Humero-Radial Index L.	..	..	..	78.5	82.8	79.7	79.2	78.3	80.4
Ulna Max. Length R.	288	..	239	..	..	272	267	287	255
Ulna Max. Length L.	..	..	..	246	..	260	263	290	250
Scapula Sup. Border R.	con-cave	..	oblique	..	..	oblique	oblique	..	con-cave
Scapula Sup. Border L.	..	..	..	..	..	oblique	con-cave	..	..
Scapular Notch R.	abs	..	med	..	..	sm	abs	..	sm
Scapular Notch L.	..	..	..	deep	..	med	sm	abs	..
Vertebral Border R.	c'vex	..	..	..	..	c'vex	..	..	c'vex
Vertebral Border L.	..	..	..	..	..	c'vex	str't	str't	c'vex
Teres Insertion R.	med	..	med	..	sm	pp	pp	..	pp
Teres Insertion L.	..	..	..	med	sm	pp	pp	sm	..
Acromion Shape R.	tri-angle	..	..	..	inter-mediate	inter-mediate	quad-range	inter-mediate	..
Acromion Shape L.	..	..	..	inter-mediate	inter-mediate	tri-angle	quad-range	inter-mediate	inter-mediate
Clavicular Facet R.	lip-ped	..	..	..	lip-ped	unlip-ped	unlip-ped	lip-ped	..
Clavicular Facet L.	..	..	..	lip-ped	lip-ped	unlip-ped	unlip-ped	unlip-ped	unlip-ped
Age Plaque R.	abs	..	..	..	abs	sm	sm	med	..
Age Plaque L.	..	..	..	sm	abs	sm	abs	med	sm
Glenoid Shape R.	oval	..	oval	elliptical	elliptical	elliptical	elliptical	oval	oval
Glenoid Shape L.	..	..	oval	elliptical	oval	oval	oval	oval	oval
Glenoid Lipping R.	abs	..	pp	pp	abs	sm	sm	sm	sm
Glenoid Lipping L.	abs	..	pp	abs	abs	sm	sm	sm	sm
Scapula Pleating R.	sm	..	..	..	..	sm	..	..	abs
Scapula Pleating L.	..	..	..	abs	abs	sm	abs	abs	..
Scapula Buckling R.	abs	..	..	..	..	pres	..	..	pp
Scapula Buckling L.	..	..	..						

TABLE A-II. ALKALI RIDGE SKELETONS: MALES (Continued)
MEASUREMENTS, OBSERVATIONS, AND INDICES

	N/ 915	N/ 917	N/ 925	N/ 928	N/ 929	N/ 931	N/ 932	N/ 933	N/ 934
Ischiatic Notch L.	..	..	nar- row	..	nar- row	nar- row	nar- row	nar- row	nar- row
Preauricular Sulcus R.	abs	sm	sm	sm	sm	med	sm	abs	sm
Preauricular Sulcus L.	..	..	sm	..	sm	sm	..	abs	abs
Ilium R.	..	med	med	erect	erect	..	erect	..	..
Ilium L.	..	..	med	..	erect	med	erect	erect	med
Ischiatic Spine R.	..	..	..	pp	..	..	..	..	..
Ischiatic Spine L.	..	..	..	..	..	..	..	pp	..
Innominate Height R.	..	..	187	187	204	..	202	216	197
Innominate Height L.	..	..	187	..	204	207	201	222	196
Innominate Breadth R.	..	..	..	..	..	..	153	151	..
Innominate Breadth L.	..	..	..	..	155	..	154	..	146
Innominate Index R.	..	..	..	..	..	..	75.7	69.9	..
Innominate Index L.	..	..	..	..	76.0	..	76.6	..	74.5
Subpubic Angle	..	nar- row	nar- row	nar- row	med- ium	nar- row	nar- row	nar- row	med- ium
Brim Shape	..	..	prism	prism	prism	heart	prism	heart	heart
Pubic Ram[	..	lip- ped	..	lip- ped	lip- ped	..	lip- ped	lip- ped	..
Pubic Rami Constriction	..	..	sm	med	sm	sm	med	med	..
Total Pelvic Breadth	..	..	251	..	269	..	269	291	..
Max. Br. Superior Strait	..	..	109	..	120	..	125	130	..
A.-P. Diam. Superior Strait	..	..	82	88	102	..	92	116	..
Bi-ischiatic Breadth	..	..	432	..	427	..	138	141	..
Interspinous Diameter	..	..	..	..	..	..	(85)	..	..
Brim Index	..	..	75.2	..	85.0	..	73.6	89.2	..
Total Pelvic Index	..	..	134.2	..	131.9	..	133.5	133.3	..
Sacrum, Number Segments	..	..	..	5	5	6(5th lumbar)	5	5	..
Sacral Curve	..	..	..	pp	pp	..	pp	med	..
Sacral Curve Begins	..	..	..	3d	3d	4th	3d	3d	..
Simian Notch	..	..	..	abs	abs	..	abs	abs	..
Sacral Type	..	..	homo- basal	homo- basal	homo- basal	..	homo- basal	homo- basal	homo- basal
Spinal Closure Begins	..	3d	4th	3d	3d	3d	..	..	5th
Arthritic Changes	..	pres	pres	..	abs	abs	pres	..	..
Sacral Height	..	..	..	90	102	..	80	96	..
Sacral Breadth	..	..	..	..	113	..	117	122	..
Sacral Index	..	..	..	..	90.3	..	68.4	78.7	..
Lumbar Centra Hts. (Ant.)	..	..	120.0	..	..	130.5	124.0	136.0	..
Lumbar Centra Hts. (Post.)	..	..	117.0	..	..	138.5	122.5	140.0	..
Lumbar Vertebrae Index	..	..	97.5	..	..	94.2	98.8	97.1	..
Calcaneum Axis Tuberos. R.	pp	..	..	med	..	med	med	pp	med
Calcaneum Axis Tuberos. L.	..	..	..	med	med	med	pp	pp	med
Tendon Attachment R.	med	..	..	low	..	med	med	med	med
Tendon Attachment L.	med	..	..	med	med	med	med	low	med
Lateral Process R.	ppp	..	..	..	..	med	..	pp	..
Lateral Process L.	ppp	..	..	..	..	med	med	pp	..
Astragalar Facets R.	sep	..	semi- fused	sep	..	sep	sep	sep	sep
Astragalar Facets L.	fused	..	..	..	sep	sep	sep	sep	semi- fused
Calcaneum Length R.	81	..	..	70	..	76	70	79	72
Calcaneum Length L.	31	..	..	..	70	79	69	80	70
Calcaneum Breadth R.	46	..	..	40	..	42	38	44	42
Calcaneum Breadth L.	45	..	..	..	37	42	38	45	42
Length-Breadth Index R.	56.8	..	..	57.1	..	55.3	54.3	55.7	58.3
Length-Breadth Index L.	55.6	..	..	..	52.9	53.1	55.1	56.2	60.0
Astragalus Angle Divers. R.	sm	..	med	med	..	sm	med	med	sm
Astragalus Angle Divers. L.	med	..	..	pp	med	sm	med	sm	med
Squatting Facets R.	abs	..	pres	pres	..	abs	abs	abs	abs
Squatting Facets L.	abs	..	..	pres	abs	abs	abs	abs	abs
Obliquity Ext. Facet R.	med	..	sm	med	..	med	med	med	sm
Obliquity Ext. Facet L.	med	..	..	pp	sm	med	med	med	med
Torsion Head R.	pp	..	pp	pp	..	med	med	pp	pp
Torsion Head L.	med	..	..	..	med	med	pp	pp	med
Astragalus Length R.	61	..	54	55	..	58	52	60	53
Astragalus Length L.	61	..	..	55	53	59	53	60	53
Astragalus Breadth R.	43	..	38	40	..	41	40	42	41
Astragalus Breadth L.	43	..	..	40	43	42	38	42	41
Astragalus Height R.	35	..	29	32	..	31	30	34	30
Astragalus Height L.	35	..	..	31	28	30	31	34	30
Length-Height Index R.	57.4	..	53.7	58.2	..	53.4	57.7	56.7	56.6
Length-Height Index L.	57.4	..	..	56.4	52.8	50.8	58.5	56.7	56.6

TABLE A-III. ALKALI RIDGE CRANIA: FEMALES

MEASUREMENTS

INDICES

	N/918	N/919	N/920	N/921	N/926	N/930		N/918	N/919	N/920	N/921	N/926	N/930
Age (approximate)	21-35	36-55	21-35	36-55	21-35	56-75		21-35	36-55	21-35	36-55	21-35	56-75
Deformation: lambdoid occipital	pron	med	med	med	..	pron		..	..	..	..	..	..
Glabello-occipital L. *	160	163	142	163	..	158		83.8	(92.5)	..	..	..	(87.5)
Maximum Width*	145	149	142	137	..	146		50.8	(55.0)	..	..	..	52.3
Basion-Bregma Height*	137	142	136	..	..	142		51.1	48.0	46.9	51.0	53.2	60.9
Thickness L. Parietal	6.0	6.0	4.7	7.0	..	6.7		94.7	..	97.2	..	87.2	87.5
Auricular Height*	91	94	85	87	..	91		94.7	90.0	97.3	89.7	85.0	85.0
Min. Frontal Diameter	123	125	124	117	..	126		50.0	70.6	81.2	68.8	76.9	79.0
Frontal Height*	120	124	121	113	..	124		21.0	..	22.2	..	20.6	22.0
Frontal Angle*	64	56	57	57	..	62		(116.7)	125.5	124.0	..	114.8	120.0
Total Facial Angle	87	87	88	84	..	88		91.8	..	..	..	..	85.3
Mid-Facial Angle	89	93	93	88	..	91		63.8	(63.6)	..	..	..	76.6
Alveolar Angle	79	70	75	81	..	78		91.2	87.2	..	..	..	107.7
Bizygomatic Diameter	130	(129)	125	(126)	..	128		70.0	72.9	68.0	(69.1)	..	71.1
Nasion-Menton Height	109	119	..	..	103	(112)							
Nasion-Prosthion Ht.	66	71	69	66	62	67		21-35	36-55	21-35	36-55	21-35	56-75
Basion-Nasion Length	95	100	94	..	..	99		sm	med	med	med	med	sm
Basion-Prosthion L.	96	92	90	..	..	96		pp	med	med	med	..	pp
Nasal Height	45	50	49	..	47	46		..	..	..	..	..	..
Nasal Breadth	23	24	23	25	25	28		..	..	..	..	..	..
Orbital Height - Left	36	36	36	36	35	35		..	..	..	..	..	..
Orbital Breadth - Left	38	38	35	36	39	40		..	..	..	..	..	..
Orbital Height - Right	36	36	36	35	34	34		..	..	..	..	..	..
Orbital Breadth - Right	38	40	37	39	40	40		..	..	..	..	..	..
Nasalia - Upper Br.	8	12	13	11	10	15		..	..	..	..	..	..
Nasalia - Lower Br.	16	17	16	16	13	19		..	..	..	..	..	..
Interorbital Breadth	20	..	20	22	20	22		..	..	..	..	..	..
Biobital Breadth	95	..	90	..	97	100		..	..	..	..	..	..
Palate - External L.	54	51	50	..	54	55		..	..	..	..	..	..
Palate - External Br.	(63)	64	62	..	62	66		..	..	..	..	..	..
Condylo-Symphysial L.	(101)	(103)	..	..	..	99		..	..	..	..	..	..
Bicondylar Width	(110)	..	..	..	..	116		..	..	..	..	..	..
Height of Symphysis	33	33	..	..	29	29		..	..	..	..	..	..
Bigonial Diameter	83	82	..	..	93	98		..	..	..	..	..	..
Min. Br. Asc. Ramus	34.5	34.5	..	34	36	33		..	..	..	..	..	..
Mean Angle Mandible	118	121	..	..	122	147		..	..	..	..	..	..
Stature (Pearson)	1483	1444	1444	..	..	..		..	..	..	..	..	..
Cranial Capacity	1190	..	..	..	..	1285		..	..	..	..	..	..
Horizontal Circumf.	476	494	..	481	..	482		..	..	..	..	..	..
Nasion-Opisthion Arc	335	347	..	(335)	..	344		..	..	..	..	..	..
Porion-Transverse Arc	334	340	324	322	..	347		..	..	..	..	..	..
Cranial Module	147.3	151.3	..	..	..	148.7		..	..	..	..	..	..

*Measurements affected by deformation.

TABLE A-III. ALKALI RIDGE CRANIA: FEMALES (Continued)

OBSERVATIONS (Continued)										OBSERVATIONS (Continued)									
N/	N/	N/	N/	N/	N/	N/	N/	N/	N/	N/	N/	N/	N/	N/	N/	N/	N/	N/	N/
918	919	920	921	926	930	918	919	920	921	926	930	918	919	920	921	926	930	918	919
Serration Coronal Suture	sm	sm	sm	..	?	Nasion Depression	abs	abs	abs	abs	abs	Nasion Depression	abs	abs	abs	abs	abs	Nasion Depression	abs
Serration Sagittal Suture	med	sm	med	..	?	Nasal Root Height	sm	sm	sm	sm	sm	Nasal Root Height	sm	med	sm	sm	sm	Nasal Root Height	sm
Occlusion Coronal Suture	abs	abs	pp	..	pp	Nasal Bridge Height	med	med	med	med	med	Nasal Bridge Height	med	med	med	med	med	Nasal Bridge Height	med
Occlusion Sagittal Suture	abs	abs	pp	..	pp	Nasal Bridge Breadth	med	med	med	med	med	Nasal Bridge Breadth	med	med	med	med	med	Nasal Bridge Breadth	med
Occlusion Lamboid Suture	abs	abs	sm	..	pp	Nasal Profile	cv-cx	cv-cx	cv-cx	cv-cx	cv-cx	Nasal Profile	st	st	st	st	st	Nasal Profile	st
Wormian Bones, Lambdoid	abs	abs	abs	..	?	Nasal Sills	dull	dull	dull	dull	dull	Nasal Sills	dull	sharp	sharp	sharp	sharp	Nasal Sills	sharp
Wormian Temporo-occipital	one	abs	abs	..	?	Nasal Spine	ssm	ssm	ssm	ssm	ssm	Nasal Spine	ssm	sm	sm	sm	sm	Nasal Spine	sm
Pterion Form Right	epi- teric	K	?	..	?	Subnasal Groove	..	..	..	..	..	Subnasal Groove	..	..	..	..	..	Subnasal Groove	..
Pterion Form Left	K	K	?	..	?	Mid-facial Prognathism	abs	abs	abs	abs	abs	Mid-facial Prognathism	abs	abs	abs	abs	abs	Mid-facial Prognathism	abs
Med. Occipital Fossa	abs	sm	med	..	abs	Alveolar Prognathism	med	med	med	med	med	Alveolar Prognathism	med	med	med	med	med	Alveolar Prognathism	med
Elevation of Condyles	med	med	med	..	med	Total Prognathism	med	med	med	med	med	Total Prognathism	med	med	med	med	med	Total Prognathism	med
Elevation of Basion	med	med	med	..	med	Palate Shape	para- bolic	para- bolic	para- bolic	para- bolic	para- bolic	Palate Shape	para- bolic	para- bolic	para- bolic	para- bolic	para- bolic	Palate Shape	para- bolic
Styloids	sm	sm	sm	..	ssm	Palate Height	pp	pp	pp	pp	pp	Palate Height	pp	pp	pp	pp	pp	Palate Height	pp
Pharyngeal Tubercle	sm	sm	sm	..	sm	Palatine Torus Size	..	..	..	..	..	Palatine Torus Size	..	..	..	..	..	Palatine Torus Size	..
Pharyngeal Fossa	abs	sm	abs	..	sm	Palatine Torus Form	ridge	ridge	ridge	ridge	ridge	Palatine Torus Form	ridge	trsv	trsv	trsv	trsv	Palatine Torus Form	trsv
Lacerate Foramina	med	sm	sm	..	sm	Palatine Transv. Suture	ant	ant	ant	ant	ant	Palatine Transv. Suture	ant	trsv	trsv	trsv	trsv	Palatine Transv. Suture	trsv
Glenoid Fossa Depth	sm	med	sm	..	med	Postnasal Spine	med	med	med	med	med	Postnasal Spine	med	sm	sm	sm	sm	Postnasal Spine	sm
Postglenoid Process	med	abs	sm	..	abs	Mandible Size	med	med	med	med	med	Mandible Size	med	med	med	med	med	Mandible Size	med
Tympanic Plate	thin	thin	med	..	oval	Chin Form	oval	oval	oval	oval	oval	Chin Form	oval	..	..	..	..	Chin Form	..
Auditory Meatus	oval	oval	oval	..	oval	Chin Projection	sm	sm	sm	sm	sm	Chin Projection	sm	..	..	..	..	Chin Projection	..
Petrous Depression	sm	med	sm	..	sm	Alveolar Prognathism	abs	abs	abs	abs	abs	Alveolar Prognathism	abs	abs	abs	abs	abs	Alveolar Prognathism	abs
Ext. Pterygoid Plate	pp	pp	med	..	med	Genial Tubercles	sm	sm	sm	sm	sm	Genial Tubercles	sm	sm	sm	sm	sm	Genial Tubercles	sm
Int. Pterygoid Plate	sm	sm	sm	..	ssm	Mylo-hyoid Ridge	med	med	med	med	med	Mylo-hyoid Ridge	med	pp	pp	pp	pp	Mylo-hyoid Ridge	pp
Pterygo-Basal Foram. R.	abs	ind	abs	..	abs	Pterygoid Attachment	med	med	med	med	med	Pterygoid Attachment	med	sm	sm	sm	sm	Pterygoid Attachment	sm
Pterygo-Basal Foram. L.	abs	ind	abs	..	abs	Gonial Angles Eversion	abs	abs	abs	abs	abs	Gonial Angles Eversion	abs	abs	abs	abs	abs	Gonial Angles Eversion	abs
Orbits Shape	rhom- boid	elli- pse	rhom- boid	..	rhom- boid	Tooth Eruption	full	full	full	full	full	Tooth Eruption	full	full	full	full	full	Tooth Eruption	full
Orbits Inclination	sm	pp	pp	pse	sm	Ante-Mortem Tooth Loss	0	0	0	0	0	Ante-Mortem Tooth Loss	0	0	0	0	0	Ante-Mortem Tooth Loss	0
Lacrimal-Ethmoid Artic.	med	pp	sm	sm	?	Mandibular Torus	sm	med	med	med	med	Mandibular Torus	sm	med	med	med	med	Mandibular Torus	med
Infra-Orbital Suture R.	none	..	sm	sm	none	Tooth Wear	0	0	0	0	0	Tooth Wear	0	0	0	0	0	Tooth Wear	0
Infra-Orbital Suture L.	none	none	none	orb	none	Tooth Caries	0	0	0	0	0	Tooth Caries	0	0	0	0	0	Tooth Caries	0
Suborbital Fossa	abs	med	sm	med	med	Abscess Number	..	..	..	..	..	Abscess Number	..	..	..	..	..	Abscess Number	..
Malars Size	pp	pp	med	pp	pp	Abscess Size	abs	abs	abs	abs	abs	Abscess Size	abs	abs	abs	abs	abs	Abscess Size	abs
Malars Lat. Projection	med	pp	pp	pp	med	Pyorrhea	med	med	med	med	med	Pyorrhea	med	med	med	med	med	Pyorrhea	med
Malars Ant. Projection	med	med	med	..	med	Shovel Incisors	edge	edge	edge	edge	edge	Shovel Incisors	edge	edge	edge	edge	edge	Shovel Incisors	edge
Marginal Process	sm	abs	abs	pp	med	Bite	sm	sm	sm	sm	sm	Bite	sm	sm	sm	sm	sm	Bite	sm
Zygomatic Proc. Thick's	med	sm	sm	sm	med	Crowding	sm	sm	sm	sm	sm	Crowding	sm	sm	sm	sm	sm	Crowding	sm
						Molar Cusps Upper	4-4-3	4-4-3	4-4-3	4-4-3	4-4-3	Molar Cusps Upper	4-4-3	4-4-3	4-4-3	4-4-3	4-4-3	Molar Cusps Upper	4-4-3
						Molar Cusps Lower	5-4-4	5-4-4	5-4-4	5-4-4	5-4-4	Molar Cusps Lower	5-4-4	5-4-4	5-4-4	5-4-4	5-4-4	Molar Cusps Lower	5-4-4

TABLE A-IV. ALKALI RIDGE SKELETONS: FEMALES
MEASUREMENTS, OBSERVATIONS, AND INDICES

	N/ 919	N/ 920	N/ 921	N/ 926	N/ 930		N/ 919	N/ 920	N/ 921	N/ 926	N/ 930
Humerus Shaft Shape R.			plano-convex	plano-convex	oblong	Age Plaque R.			abs		N/ 930
Humerus Shaft Shape L.			..	trapezoid	prismatic	Age Plaque L. R.			sm		abs
Perf. Olecranon Fossa R.			abs	abs	pres	Glenoid Shape L. R.			oval		sm
Perf. Olecranon Fossa L.			..	pres	pres	Glenoid Shape L.			oval		oval
Supracondylar Process R.			trace?	abs	pres	Scapula Height R.			135		118
Supracondylar Process L.			..	abs	abs	Scapula Height L.			135		122
Humerus Max. Length R.	276		293	269	274	Scapula Inferior Ht. R.	91		101		92
Humerus Max. Length L.	269		279	269	279	Scapula Inferior Ht. L.	96		102		88
H. Max. Middle Diam. R.	20		22	20	21	Scapula Breadth R.	97		94		74.6
H. Max. Middle Diam. L.	20		..	19	21	Scapula Breadth L.	..		71.1		..
H. Min. Middle Diam. R.	13		14	14	14	Total Scap. Index R.	..		..		..
H. Min. Middle Diam. L.	37		40	37	34	Inferior Scap. Index R.	105.5		67.4		95.6
H. Max. Diam. Head R.	(33)		41	..	34	Clavicle Max. Length R.	..		91.9		..
H. Max. Diam. Head L.	(33)		63.6	..	34	Clavicle Max. Length L.	..		128		..
Middle Index R.	65.0		..	70.0	66.7	Claviculo-Humeral Index R.	..		128		..
Middle Index L.	70.8		..	73.7	71.4	Claviculo-Humeral Index L.	..		47.8		..
Humero-Femoral Index R.	77.1		..	..	..	Sternum Fusion	..		..		corpus
Humero-Femoral Index L.	72.3		..	..	..	Sternal Foramen	..		..		abs
Radius Bowing R.	abs		med	med	..	Suprasternal Ossification	..		abs		abs
Radius Bowing L.	sm		med	med	..	Sternal Ribs	..		3?		7
Radius Shaft Shape R.	prism		med	prism	prism	Glenoid Lipping R.	abs		sm		abs
Radius Shaft Shape L.	prism		..	prism	prism	Glenoid Lipping L.	..		pp		abs
Interosseous Crest R.	sm		prism	med	med	Scapula Pleating R.	abs		abs		abs
Interosseous Crest L.	sm		sm	sm	med	Scapula Pleating L.	..		abs		abs
Radius Max. Length R.	212		..	..	..	Scapula Buckling R.	pres		pres		pres
Radius Max. Length L.	207		220	203	..	Scapula Buckling L.	pres		pres		abs
Humero-Radial Index R.	76.0		..	..	..	Atrophic Patches R.	..		sm		abs
Humero-Radial Index L.	77.0		..	..	..	Atrophic Patches L.	..		abs		..
Ulna Max. Length R.	228		241	..	..	Femur Third Trochanter R.	..		abs		..
Ulna Max. Length L.	224		238	..	..	Femur Third Trochanter L.	sm		abs		abs
Scapula Sup. Border R.	..		con-	..	..	Crista Hypotrochanterica R.	..		abs		..
Scapula Sup. Border L.	..		cave	..	..	Crista Hypotrochanterica L.	..		abs		..
Scapular Notch R.	..		..	con-	..	Fossa Hypotrochanterica R.	abs		abs		med
Scapular Notch L.	deep		abs	cave	..	Fossa Hypotrochanterica L.	..		abs		abs
Vertebral Border R.	..		..	med	..	Femur Torsion R.	sm		abs		..
Vertebral Border L.	str't		c've	med	str't	Femur Torsion L.	sm		abs		..
Teres Insertion R.	c'vex		c'vex	c'vex	..	Poirier's Facet R.	abs		abs		abs
Teres Insertion L.	med		med	..	pp	Poirier's Facet L.	abs		abs		..
Acromion Shape R.	..		pp	med	pp	Femur Bowing R.	sm		pp		..
Acromion Shape L.	..		tri-	..	pp	Femur Bowing L.	..		pp		..
Clavicular Facet R.	..		angle	..	quad-	Femur Shaft Shape R.	oval		prism		..
Clavicular Facet L.	..		tri-	..	angle	Femur Shaft Shape L.	..		oval		..
	..		lipped	..	inter-	Bicondylar Length R.	362		..		..
	..		lipped	..	mediate	Bicondylar Length L.	364		..		..
	..		..	..	unlipped	Maximum Length R.	363		..		..
	..		..	..	unlipped	Maximum Length L.	390		..		..

TABLE A-IV. ALKALI RIDGE SKELETONS: FEMALES (Continued)
MEASUREMENTS, OBSERVATIONS, AND INDICES

	N/ 919	N/ 920	N/ 921	N/ 926	N/ 930		N/ 919	N/ 920	N/ 921	N/ 926	N/ 930
Maximum Diameter Head R.		(39)				Ilium L.					
Maximum Diameter Head L.		35		36		Ischiatic Spine R.	..	med			
Subtrochanter Antero-R.		20	21			Ischiatic Spine L.	pp				
Posterior Diameter L.	20	(21)	22	21		Innminate Height R.	183	174	187	184	med
Subtrochanter Late-R.	27	(25)	23			Innminate Height L.	..	173	191	..	182
Middle Antero-Poste-R.	23	21	27	26		Innminate Breadth R.	..	148	148	..	..
Middle Lateral Diam. R.	23	..	24	23		Innminate Breadth L.	..	147	..	..	..
Middle Lateral Diam. L.	23	..	23			Innminate Index R.	..	79.1	..	..	..
Platymetric Index R.	74.1	87.0	75.0	22		Innminate Index L.	..	77.0	..	..	..
Platymetric Index L.		..	73.3	80.8		Subpubic Angle	med	heart	..	wide	..
Middle Index R.		110.5	117.4			Brim Shape	heart	lip-	..	..	..
Middle Index L.		..	..			Pubic Rami	lip-	ped	..	..	..
Tibia Retroversion Head R.		..	sm	112.5	95.6	Pubic Rami Constriction	med	sm	med	..	..
Tibia Retroversion Head L.	sm	med	med			Total Pelvic Breadth	..	272	272	..	..
Tibia Shaft Shape (Hrd-R. L.)	II	I	V			Max. Br. Superior Strait	..	101	129	..	..
Squatting Facets R.		abs	II			A-P Diam. "	..	96	104	..	..
Squatting Facets L.		sm	abs			Bischiatic Breadth	..	123	..	..	..
Tibia Maximum Length R.	317	(308)	332	pres		Interspinoous Diam.	..	..	80.6	..	..
Tibia Maximum Length L.	..	306	330			Brim Index	..	143.9	143.9	..	..
Middle Antero-Post. R.	27	23	29			Total Pelvic Index	..	126.8	..	..	5
Middle Antero-Post. L.	..	23	27	27		Sacrum, Number Segments	5	..	6 (5th lumbar)	..	..
Middle Lateral R.	18	18	20	27		Sacral Curve	sm	..	pp	..	pp
Nutrient Foramen A.-P R.	..	18	19	17		Sacral Curve Begins	4th	..	3d	..	4th
Nutrient Foramen A.-P L.	28	24	32			Simian Notch	..	..	abs	..	abs
Nutrient Foramen Lat. R.	20	20	21	29		Sacral Type	homo-basal	homo-basal	hyper-basal	..	homo-basal
Nutrient Foramen Lat. L.	..	19	20	18		Spinal Closure Begins	4th	pres	3d	..	5th
Middle Index R.	66.7	78.3	69.0			Arthritic Changes	abs	pres	pres	..	pres
Middle Index L.	..	78.3	70.4	63.0		Sacral Height	..	102	81	..	105
Platycnemic Index R.	71.4	83.3	65.6			Sacral Breadth	..	112	..	..	..
Platycnemic Index L.	..	82.6	64.5	62.1		Sacral Index	..	72.3	..	..	77.1
Fibula Max. Length R.	..	..	317	315		Lumbar Centra Hts. (Ant.)	..	..	..	..	125.0
Fibula Max. Length L.	..	..	..			Lumbar Centra Hts. (Post.)	..	..	..	..	115.0
Tibio-Femoral Index R.	81.3	84.8	..			Lumbar Vertebrae Index	..	..	..	..	92.0
Tibio-Femoral Index L.	..	IV	X	V		Calcaneum Axis Tuberos. R.	med	med	pp	med	med
Pubic Symphysis Phase R.	..	V	IX			Calcaneum Axis Tuberos. L.	..	med	med	med	med
Pubic Symphysis Phase L.	..	..	IX			Tendon Attachment R.	low	med	med	med	med
Pubic Exostoses R.	..	..	pres	pres		Tendon Attachment L.	..	med	..	med	med
Pubic Exostoses L.	..	..	med	wide		Lateral Process R.	med	..	..	sm	med
Ischiatic Notch R.	..	med	med			Lateral Process L.	..	..	..	sep	fused
Ischiatic Notch L.	..	sm	med			Astragalar Facets R.	..	fused	..	..	..
Preauricular Sulcus R.	med	abs	ppp	pp		Astragalar Facets L.	fused	sep	semi-fused	sep	fused
Preauricular Sulcus L.	erect	erect	med	ring		Calcaneum Length R.	..	58	69	64	63
Ilium R.	..	..	med			Calcaneum Length L.	..	..	68	65	62

APPENDIX B

ALKALI RIDGE SKELETONS, PATHOLOGY AND ANOMALY

BY ALICE BRUES

N/915 — Fragmentary cranium of adult. Site 4.
Healed osteoporosis.

N/917 — Cranium of middle-aged male. Site 8, Burial 1.
Healed osteoporosis with thickening along the coronal suture.

Bipartite os lambda.

N/918 — Cranium of young adult female. Site 8, Burial 2.

Healed osteoporosis.

Os lambda.

Left third lower molar slightly tipped.

N/919 — Adult female. Site 12, Burial 1.

Healed osteoporosis.

A small pit at inion in place of a protuberance.

Fibula slightly bowed.

N/920 — Young adult female. Site 12, Burial 3.

Extensive deformation of the pelvis. The left innominate is fused to the sacrum (fig. 191, *c*), and both innominates lack the normal amount of curvature in the region of the superior ramus of the pubis, so that the pelvic brim has a triangular shape suggestive of rickets. The right acetabulum shows a pathological erosion with a perforation through to the inside of the pelvis. Corresponding to this is an erosion of the femoral head at the insertion of the ligamentum teres. The femoral head is slightly mushroomed.

The left femur shows evidence of periostitis in the lower part of the shaft.

N/922 — Sub-adult male. Site 5, Burial 2.

The right frontal region and orbit are broken in, apparently by a blow from some heavy cutting instrument before death.

Two ribs, a second and third, are fused at the posterior part of the bodies.

N/923 — Child, 14-15 years. Site 5, Burial 3.

The right first rib shows fusion of an anomalous element which extends upward and inward from the middle part of the rib, continuing the natural plane of the bone, and ends in a projection the end of which displays a surface like that on which an epiphysis will later appear. Although it suggests the head of an accessory rib fused to the first, the position in which this extra piece lies would not allow of articulation with any part of the vertebral column.

The left first cuneiform bone is composed of two elements separate on the upper and internal side but fused along the lateral articular surface. The division is in a longitudinal direction.

N/924 — Cranial fragments of infant. Site 5, Burial 5.
Extensive unhealed osteoporosis on parietals.

N/925 — Old male. Site 5, Burial 6.

The coronal suture is extremely peculiar; throughout its length except for small intervals, it appears to be doubled, presenting really two parallel sutures 2 or 3 mm. apart, which by occasionally meeting produce a succession of small wormian bones. The largest of these is 4 mm. wide and 30 mm. long. On the left side this condition is further complicated by a considerable heaping up of more or less smooth bone on either side of the suture.

The frontal region, especially over the left orbit, shows a generalized cicatrization. A similar condition is apparent to a limited degree along the lower border of the nasal aperture.

Arthritis is evident in the head of the right humerus and the heads of both radii; two cervical vertebrae are fused as the result of arthritic changes.

Evidence of some infective process is also seen on the right humerus, which is thickened along the deltoid ridge, and in the right clavicle, which is enlarged. The sternum also is swollen and roughened by bony outgrowths, probably as a result of severe periostitis.

N/928 — Middle-aged male. Site 5, Burial 9.

Slight healed osteoporosis.

Small button osteoma on frontal.

The ossification of the sternum is abnormal; apparently the first segment of the corpus has fused prematurely to the manubrium, producing an apparently very long manubrium and short corpus.

N/929 — Middle-aged male. Site 5, Burial 10.

Wormian bones at lambda.

Exostoses on fibula and at the sternal end of the first rib.

One rib shows evidences of an old infection of some sort.

N/930 — Old female. Site 5, Burial 11.

Healed osteoporosis.

Arthritic changes in the mandibular articulation.

There is a compression fracture of the thoracic vertebrae, resulting in considerable forward curvature of the spine. That this condition was of long standing is shown by the deformity of the ribs, which show less than the normal amount of curvature in mid-shaft. This probably compensated to some extent for the reduction of the chest cavity that would follow from the curvature of the spine.

N/931 — Middle-aged male. Site 5, Burial 12.

Exostoses probably of arthritic origin are present on clavicles and ribs. The manubrium has a completely ossified rib cartilage attached.

N/932 — Middle-aged male. Site 13. Pit House D.

Healed osteoporosis.

The left first and second ribs are fused at the necks.

The seventh cervical vertebra shows an abnormally long costal process which, although fused to the vertebra, may be considered a cervical rib.

The neural arch of the fifth lumbar vertebra has failed to unite to the body.

N/933 — Middle-aged male. Site 13, Unit 3, Kiva, Skeleton 1.

The lower incisor teeth are crowded and an impacted third molar is present.

Arthritic exostoses are found around the sacroiliac joint, along the linea aspera and at the attachment of the patellar tendon. Ossified cartilages are present on the sternum. There is partial ossification of the ligamenta flava of the vertebral column.

The left side of the head is broken in; a crack extending across the face is apparently the result of the same force. Deeply stained scratches in a position indicative of scalping are also found. Since part of an arrow-head was found imbedded in one of the dorsal vertebrae (fig. 191, *i-i'*), it seems certain that this individual met with a violent end.

N/934 — Male. Site 13, Unit 3, Kiva, Skeleton 2.

A small button osteoma is present on the frontal.

An inspection of the pathological record of the Alkali Ridge skeletons gives the impression of generally poor health. Out of seventeen specimens (excluding skeletons of children, not well preserved), we find two individuals definitely crippled; one by disease of the hip-joint associated with a deformity of the pelvis, and another by compression fracture of the vertebrae, producing about sixty degrees forward curvature of the spine. There is no evident cause for either condition; though the first case, in the deformity of the pelvis, suggests a rachitic condition. The spinal fracture is probably not due to uncomplicated violence; some atrophic or diseased condition usually precedes collapse of the centra. Tuberculosis is not indicated in

this specimen, however. In addition to these two cases of marked disability, there were two individuals with evidences of periostitis and three suffering from some degree of arthritis. Indications of healed osteoporosis are found in seven adult skulls; one of the infant skulls shows an unusually severe active case of that disease.

Of the conditions listed above, the osteoporosis at least indicates malnutrition and probable vitamin deficiency; the same causes probably contributed to the pelvic and spinal deformities. At the same time it must be remembered that a high incidence of obvious pathology in a series of skeletons indicates that a smaller proportion of the population died of the acute infectious diseases which take individuals without warning after previous good health. The fact that comparatively few individuals appear to have died "unexpectedly, after a brief illness," also reflects somewhat on the social attitudes of the community. In the case particularly of the hunchbacked woman, whose deformity was evidently of long standing and who nevertheless was one of the two individuals in the group who lived to be sixty or over, it is clear that the community accorded consideration, at least to the extent of adequate food and shelter, to an individual incapable of a full contribution to the general welfare.

Two males, one sub-adult and one middle-aged, met violent ends by well-placed blows to the head. One of these was shot in the trunk also; apparently the settlements were by no means safe from hostile attack.

The most interesting feature of the collection is the occurrence of three cases of fused or bifurcated ribs, an anomaly ordinarily so rare that only five cases have previously been observed in the Peabody Museum collections. There is considerable variation in type; the commonest form is a bifurcation at the sternal end of a rib, normal in the head and neck region. Three cases of this sort are found in the Museum collections, one from New Mexico and two from Egypt; a third specimen from Egypt, represented only by a fragment, is probably of this type also. Another form of the anomaly is the bicapital rib, in which two heads and necks are present which fuse into a single broad rib below; apparently this type always involves either the first and second ribs or the first thoracic and a cervical rib. One specimen in the collections, from Kwituki, Arizona, is a typical bicapital rib. This form has been recorded numerous times in white cadaver material. Two cases are reported from prehistoric Mexican skeletons by Hrdlička.¹ Another instance in the Peabody Museum collections, from Red Rock Valley, Arizona, resembles this type in having two heads; but the ultimate junction of the ribs is nearly at the sternal extremity and apparently includes part of the costal cartilages, at

¹ Description of an ancient anomalous skeleton from the Valley of Mexico. American Museum of Natural History, Bulletin, vol. 12, pp. 81-107. 1899. New York.

least of the first rib, abnormally ossified and conjoined to the bony bridge between the two ribs.

Of the three cases of fused ribs in the Alkali Ridge collection none are of the typical forms mentioned above. In two cases the ribs are separate and distinct, both proximal and distal to the juncture. In one instance the proximal end resembles a typical bicipital rib, with a juncture taking place about 20 mm. distal to the tuberosities; the bone then continues as one broad flat rib for approximately 60 mm., and then divides again so as to leave two separate sternal ends about 50 mm. in length. In the second of the Alkali Ridge specimens the fused portion is shorter, consisting of a strong bony bridge about 17 mm. long between the heads and tuberosities of the two ribs. The third, that of an immature individual, cannot be placed in any definite category, nor are its anatomical relations easy to imagine. The accessory portion in this case does not extend far enough back to have articulated with the vertebral column, nor far enough forward or at a suitable angle to have been connected to the sternum by a costal cartilage. It may possibly have been connected by a cartilaginous attachment to the distal end of a cervical rib which has been lost.

The circumstance of three such instances among twenty-two specimens from the same area, differing somewhat in type, and yet so unusual that their association cannot be considered coincidental, has several interesting aspects. The tendency to fusion of ribs, though in different individuals it may take different forms, apparently has a common hereditary basis. Of the Alkali Ridge specimens it is actually the two unlike in detail, the pair of ribs fused in midshaft and the first rib with the anomalous extra projection, which were found in the same site. The third specimen, which most closely resembles the first-mentioned, was found about 3.5 miles away. Since one of these presents a transition between the bicipital rib and the sternally bifurcated type, it seems justifiable to assume that the two different forms are manifestations of the same tendency. It is perhaps not unreasonable to suggest that another anomaly in the series — the sternum

in which the separation of manubrium and corpus is one segment lower than usual — is a manifestation of the same disturbance of the thoracic segmentation which is evidenced by the abnormal ribs.

The remarkably high incidence of an abnormality ordinarily so rare suggests the possibility of considerable inbreeding. If the trait is recessive, as anomalies of this sort most frequently are, a fairly high degree of inbreeding would be necessary to bring it to light in so many cases; even if it were dominant, it would indicate a high degree of ultimate relationship between the members of the group; for if a gene introduced originally by a single individual, or occurring locally as a mutation, attained such a high frequency, the total number of ancestors at the time the trait first appeared cannot have been large. The situation indicated is similar to that found at the present time among some of the old white groups of the Appalachians, where isolation of local groups, due in part to geographical and in part to psychological causes, leads to local inbreeding and frequently to release of undesirable physical traits. The fusion of ribs in itself, though for the most part harmless, may when the first rib is involved lead to fatal complications by its interference with the spinal nerves. The Alkali Ridge people and contemporary groups living in scattered settlements and having possibly a disinclination to travel as well, may have been plagued by other undesirable traits not apparent in the skeleton but more unfortunate in life.

The picture evoked by the mortal remains of the Alkali Ridge people is that of a population suffering from two primary evils, malnutrition and hostile attack. In addition there seems to have been a certain degree of provincialism which discouraged contacts between various settlements; this perhaps lessened the threat of epidemic diseases but led to local inbreeding with its consequent exaggeration of hereditary debilities. The morale of these self-sufficient villages with regard to the care of the infirm was, however, good; a natural result perhaps of the limited social horizon in which the individual assumed a larger degree of importance.

APPENDIX C

PLANT MATERIALS FROM ALKALI RIDGE SITES

BY VOLNEY H. JONES¹

TWENTY-ONE lots of plant remains from Alkali Ridge sites were examined. The bulk of these (16 lots) are from Pueblo I levels at Site 13. The remaining 5 lots originated as follows: Site 11, a Pueblo II site, 1 lot; Site 12, also Pueblo II, 2 lots; and Site 1, a Pueblo III site, 2 lots. Most of the material had been preserved by carbonization with only 2 lots not charred. The effect of fire and weathering has in many instances obscured diagnostic features so that identification and interpretation of the material cannot always be certain.

The material is primarily of corn and beans. Uncultivated food plants are represented only by pinyon nuts. An interesting item from Site 13 (no. 3518) seems to be the remains of a necklace of segments of reed grass strung on cord. One lot of seeds of croton plant (no. 1239) may have been used for medicinal purposes. The purpose of the remaining items such as charcoal and bark(?) is not evident.

The material is in the Peabody Museum under catalogue numbers as listed below.²

Site 13, Pueblo I

3508 Room 17A

Masses of charred, fused corn made up of cobs and rows of kernels still aligned as on the cob, apparently from storage of stacked ears. There are also loose kernels and cob fragments but no whole ears remain.

The cob fragments are from 1.5 to 2 cms. in diameter and are circular in cross section. The number of rows of kernels was originally 12 and 14. The kernels are wedge-shaped and average about 7 to 8 mms. in both width and depth. Apparently only a single variety is represented.

3512 Room 100A

About half a pint of loose, charred corn kernels. There are no ear or cob fragments to indicate the nature of the ear. On the basis of kernel form and of dimensions, apparently two varieties are suggested:

(a) Kernels about 9 mms. in width and about 7 mms. in depth. More or less crescent-shaped.

(b) Kernels from 7-8 mms. in both width and depth and wedge-shaped.

3513 Room 114 "corn from under jar"

A small quantity of charred corn kernels averaging about 8 mms. in width and about 7.5 mms. in depth. Most of these are wedge-shaped but a few tend toward crescent shape. There is probably no more variation than might be found on different parts of a single ear and likely only a single variety is represented in this sample.

A few charred single cotyledons of beans were with the corn. Some of these are complete but others fragmentary. These are of small size, being from 8.5 to 9 mms. long and 4.5 to 5 mms. wide. These fall within the size range of the tepary bean (*Phaseolus acutifolius*) rather than that of the kidney bean (*Phaseolus vulgaris*) but a definite identification on such a small and poorly preserved sample is not warranted.

3514 Rooms 114-118

A portion of an ear, masses of cobs and kernels, and loose kernels of corn, all charred.

The portion of ear is about 3.5 cms. in diameter, the cob constituting about 2 cms. It has 12 irregular rows of kernels. Both ear and cob are circular in cross section. A few of the kernels seem to exhibit slight denting, but in their charred and not too well-preserved condition it is difficult to be certain on this particular point.

The kernels on the ear portion, in masses, and loose, are similar in their wedge shape but there is some variation in size. Those on the ear portion are from 7 to 8 mms. in both width and depth, averaging about 7.5 mms. in each dimension. The other kernels seem to average somewhat less (slightly under 7 mms.) but are similar otherwise. Probably all are from a single variety.

With the corn is a piece of charred wood of diffusely porous structure. It may possibly be willow but remains without critical identification.

¹ Assistant Professor of Anthropology and Director of the Ethnobotanic Laboratory, University of Michigan.

² Dr. Jones' report describes only the plant remains which were brought in to the Museum. All material

was not preserved. We did not attempt, as we should have done, to save the extremely fragile remains of pumpkins or gourds which we occasionally encountered and all corn remains were not kept.—J. O. Brew

3515 Room 117

Charred and fused masses of corn consisting of cobs and kernels, aligned as if burned while stacked in storage, also loose kernels and cob fragments.

Most of the cobs are circular in cross section and from 1.5 to 2 cms. in diameter with the majority nearer the latter figure. One cob butt is distinctive in being 2.5 cms. in greatest diameter and elliptical in cross section. There are also a few nubbin-like cob fragments which are only about 1 cm. in diameter. The cobs range in row number from 10 to 14 with 12 the most common.

The kernels are rather uniformly wedge-shaped and mostly from 7 to 8 mms. in both width and depth. A few are as small as 6 mms. in each dimension. There is again some faint suggestion of shallow denting on a few of the kernels.

In spite of small variations, there is sufficient uniformity in the lot to suggest a single variety.

3515 A Room 111

A mass of charred, fused corn kernels still aligned as on the cob but no whole ears and no cobs remain. The kernels apparently are from about three ears. The kernels are wedge-shaped and rather small, averaging perhaps a little over 7 mms. in both width and depth. Judging from the number of rows present and degree of curvature the ears must have had 10 to 12 rows of kernels.

3516 Room 212

A quantity of charred beans, a few of which are whole, but most are single cotyledons or fragments. There is considerable variability in size and shape as follows:

(a) The majority are from 14 to 15 mms. long and 7 to 8 mms. wide and have the typical aspect of the kidney bean (*Phaseolus vulgaris*).

(b) There are a few larger specimens about 16 by 9 mms. which are broader and flatter and suggest the lima bean (*Phaseolus lunatus*).

(c) A few others which are only about 9 mms. long and about 5 mms. wide fall into the size range of the tepary bean (*Phaseolus acutifolius*).

3517 Room 213

About a pint of charred corn kernels with bits of grass and other extraneous materials. The kernels are not well preserved and their characteristics not readily evident. Judging by form and dimensions, two varieties with the following characteristics seem to be present:

(a) Wedge-shaped kernels which average about 7 mms. wide and 8 mms. deep.

(b) Crescent-shaped kernels which average about 9 mms. wide and about 8 mms. deep.

3518 Room 212

The charred remains of what seems to have been a necklace composed of segments of the culms of reed

grass (*Phragmites communis*) strung on fibrous cord. The cord is about 1 mm. in diameter and of two strands twisted together in a counterclockwise direction.

Miss Marcelotte Leake, who kindly undertook to examine the fibers, reports:

"The fibers are badly charred. I feel that the material is probably apocynum rather than cotton because the *twist* of cotton seen in other charred specimens is lacking. There is still the possibility that the material is cotton.

"The fibers are certainly not from yucca or related genera.

"Charring of the fibers makes it impossible to see any wall structure."

With the necklace are other miscellaneous materials such as bits of charcoal and small fragments of bean cotyledons.

3519 Room 219

A quantity of charred bean cotyledons, many of which are broken and fragmentary. These cotyledons vary from about 10 to 15 mms. long and 5 to 8 mms. wide. The averages are about 13.5 mms. in length and about 6.5 mms. in width. In spite of the considerable variation in size, all of these specimens fall within the size range of the kidney bean (*Phaseolus vulgaris*).

3520 Room 241

A quantity of charred portions of ears, cobs, and loose kernels of corn. The ear portions are from 3.2 to 3.5 cms. in diameter. The cobs range from 1.5 to 2 cms. in diameter. Both the ear portions and cobs are circular in cross section. The number of rows of kernels is 12 and 14, mostly fairly straight and even.

The kernels from the ear portions are wedge-shaped and about 7 to 8 mms. in both width and depth. Most of the kernels in the residue show the same characteristics but a few diverge in being quite large and flat, measuring about 10 mms. in both width and depth. These latter apparently are of a different variety as they could not have come from cobs of the nature of the ear portions.

3521 Room 241

About a pint of charred nuts of the pinyon pine (*Pinus edulis*). Most of these are whole nuts which have been removed from the cones, but some broken shells and loose nut meats are present. These nuts, found in a pottery jar (fig. 98, d), are said to be from a cache. It is a fairly pure lot, but a few charred corn kernels, bits of charcoal, and other debris are present.

This cache undoubtedly was for stored food, as the pinyon nut was and still is an important food staple among the Indians of the Southwest and the Great Basin country.

3522 Room 297

Masses of charred, fused bean cotyledons and some loose cotyledons. These may be divided into two

distinct groups on the basis of form and dimensions:

(a) Comparatively large, broad and flat, from 13 to 16 mms. in length and 8 to 9 mms. wide. These compare well with some of the smaller sieva-type lima beans (*Phaseolus lunatus*), and probably fall there.

(b) From 10 to 11 mms. long and 4.5 to 5.5 mms. wide, and seems to be a small type of kidney bean (*Phaseolus vulgaris*).

Mixed with these beans are several charred pieces of nodes of cactus, doubtless from prickly pear cactus (*Opuntia* sp.). No explanation for their presence is offered.

3524 Storerooms

A handful of charred corn kernels, many whole and well preserved but others imperfect and broken. The kernels are wedge-shaped, approaching rectangular, and average about 8 mms. in both width and depth.

1298 Floor of Pithouse A

Two pieces of uncharred papery material which may possibly be strips of bark but are unidentified.

3510 A Storerooms

A double handful of charred beans a few of which are whole but most of which are single cotyledons. These all seem to be kidney beans (*Phaseolus vulgaris*), but fall into three groups on the basis of form and dimensions:

(a) Rather broad and flat, average length 13 mms., average width 7.5 mms.

(b) Narrow and slender, average length 12 mms., average width 6 mms.

(c) Fat, navy bean shape, average length 10 mms., average width 5.5 mms.

There are few if any intergrades between these, and probably three agricultural varieties are represented.

Site 11, Pueblo II

1113 Jacal house, west end (Area C, fig. 20)

A quantity of charred beans consisting of a number of whole beans, many single cotyledons, and many fragments. These seem to fall into three groups.

(a) Apparently kidney beans (*Phaseolus vulgaris*) varying from 12 to 15 mms. long and 7 to 8 mms. wide.

(b) A few specimens which seem to be of a smaller and more slender type of kidney bean (*Phaseolus vulgaris*), averaging about 10 mms. in length and about 5 mms. in width.

(c) Smaller beans which average about 8 mms. long and about 5 mms. wide. A few are extremely small, measuring only 7 by 4 mms. In size and appearance all of these small beans suggest the tepary bean (*Phaseolus acutifolius*).

With the beans is a single charred corn kernel 8.5 mms. long and 8 mms. deep, tending toward crescent shape.

Site 12, Pueblo II

1141 from Kiva 2

Several pieces of charcoal from limbs (or trunks) about 1.5 cms. in diameter. These are of wood from some coniferous tree but are not identified further. The purpose of these is not evident.

1239 Refuse Mound

A small quantity of seeds (not affected by fire) which appear to be of some species of croton weed, which in this region would likely be *Croton texensis*. Seeds of this species have been found in archaeological sites in the Rio Grande and Little Colorado drainages but not under circumstances to suggest their use. The seeds are bitter and purgative and unsuitable for food. They may have been used by the Pueblo peoples as medicine, as seeds of other species have been in modern medicine.

Site 1, Pueblo III

7572 on kiva floor

Seven charred beans and bean fragments found in a stone bowl on the floor of a kiva. All are apparently kidney beans (*Phaseolus vulgaris*) ranging from 13 to 14.5 mms. long and from 6 to 7 mms. wide.

7573 Room 3 Site A 1 (central room) SU24 (?)

Charred corn including portions of ears, cob fragments, and loose kernels. The ear portions are about 2.5 cms. in diameter with cobs constituting about 1 cm. of this. Both the ears and cobs seem to have been circular in cross section. No full-round ear portions remain but from the half-round it is apparent that some of the ears had 10 rows of kernels and others 12 rows. The kernels are slenderly wedge-shaped, being 6 to 7 mms. wide and rather uniformly 8 mms. deep. These ears were unusually slender and small-cobbed with small kernels narrow in relation to depth.

SUMMARY OF CORN

Most of the corn (9 lots) was from Site 13 and of Pueblo I period. A general uniformity runs through this and the great majority of it seems to fall into a single type, having the following characteristics:

Ear diameter of about 3.2 to 3.5 cms. No data as to ear length. Ears circular in cross section.

Cobs mostly 1.5 to 2 cms. in diameter with extremes of 1 cm. and 2.5 cms. Cobs circular in cross section.

Row numbers 10, 12, and 14 with 12 most common. Rows mostly straight and even.

Kernels wedge-shaped and ranging from about 6 to 8 mms. in both width and depth with the average of each dimension about 7.5 mms.

A small amount of the corn diverges from this type. Numbers 3512 (a) and 3517 (b) have larger kernels which are crescent-shaped. Number 3520 has a few quite large, flat kernels. It is possible that these were

types of corn different from the above and that the Pueblo I people had three types of corn, one of which was grown much more commonly than the others.

Only a single kernel of corn (number 1113) was brought back in the material from Pueblo II sites. On comparison with the Pueblo I corn it seems to fit in more closely with the rare crescent-shaped type, but the sample is inadequate to classify with any certainty.

From the Pueblo III period there is one lot of corn (number 7573) which does not conform very closely to any of the Pueblo I types. It is closer to the first more common type but diverges in having distinctly more slender ears with small cobs and smaller kernels, narrow in relation to their width.

In the charred condition it is not possible to determine the starch patterns of the kernels, and we are unable to say whether the corn is flour corn, flint corn, or some other type. Flour corn is the type most commonly found in Pueblo sites and might be the best guess. There is little indication that the partly dented corn with elliptical cobs, so typical of late Pueblo sites and modern Pueblo agriculture, was present in these sites. There is one elliptical cob (in number 3515) and faint signs of denting in some kernels of 2 lots (numbers 3514 and 3515), but the corn in general bears no similarity to the semi-dent type.

SUMMARY OF BEANS

There are seven samples of beans, 5 from the Pueblo I period and 1 each from Pueblo II and Pueblo III.

All of the beans are charred, and in most the seed coat has burned away and the cotyledons have fallen apart. A few specimens though charred remain intact. Identification and classification must depend on cotyledon form and dimensions without such useful aids as color and hilum characters.

The Pueblo I beans appear to be mostly kidney beans (*Phaseolus vulgaris*) and the great majority have what might be called a "normal" shape and fall within a size range of 10 to 15 mms. in length and 5 to 8 mms. in width. It is not possible to say how many agricultural varieties might be represented within this "normal" range. A few narrow, slender beans (3510 A, category [b]) and others of a short, fat form (same lot, category [c]) are separated as likely constituting distinct types but still are thought to be kidney beans.

Certain broad, flat beans (3522 [a] and 3516 [b]) are considered to be more typical of lima beans (*Phaseolus lunatus*) than kidney beans. Some of the very small beans (3513 and 3516 [c]) are considered as the tepary bean (*Phaseolus acutifolius*). It thus appears that in the Pueblo I period at Alkali Ridge three species of cultivated beans were already present, but due to the condition of the material too much confidence cannot be placed in these identifications.

The Pueblo II beans (1113) seem to show two types of kidney beans and possibly a small admixture of teparies. The lot of Pueblo III beans falls within the "normal" size and form of kidney beans and no other species seems to be present.

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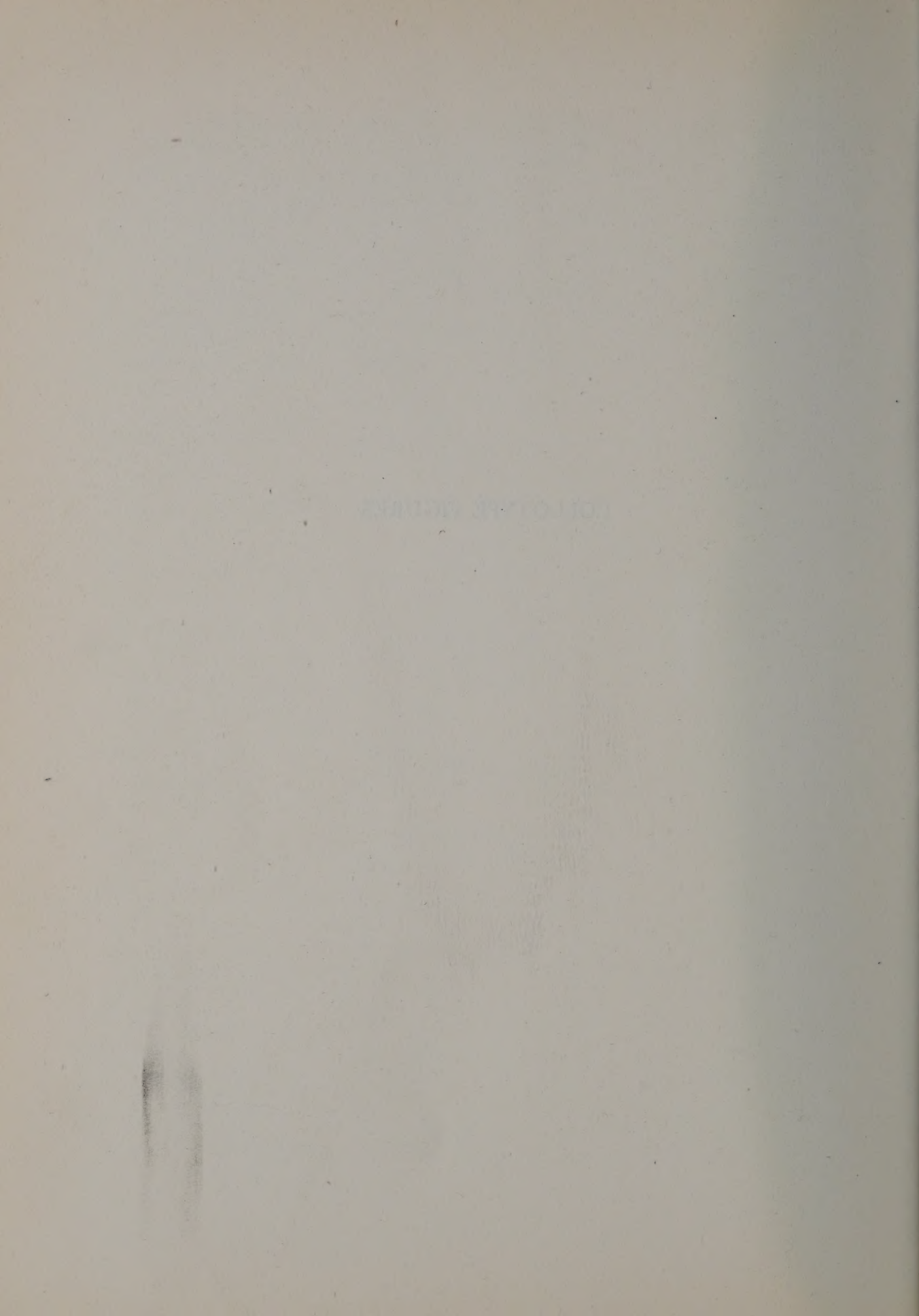
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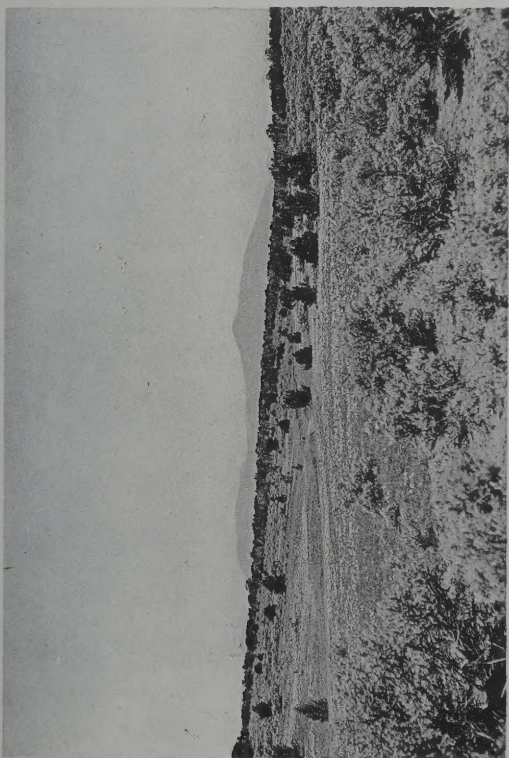
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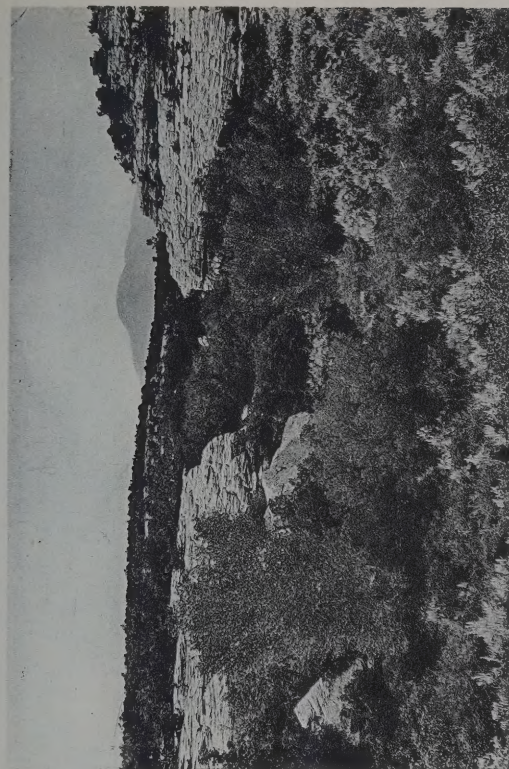
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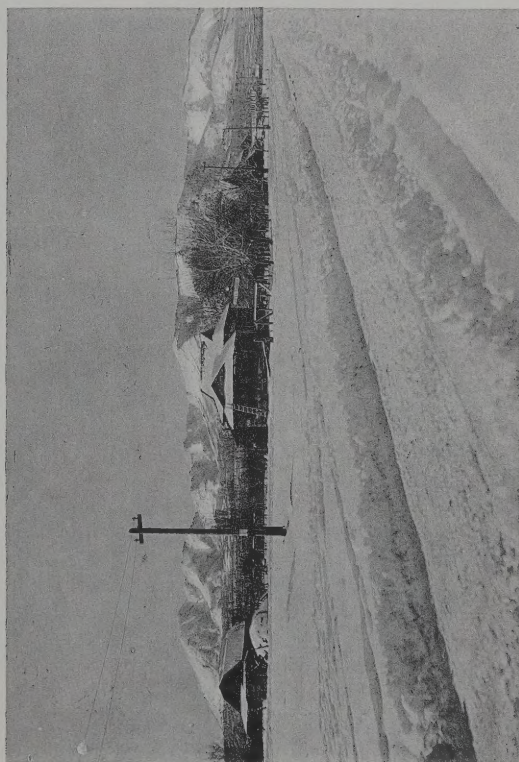




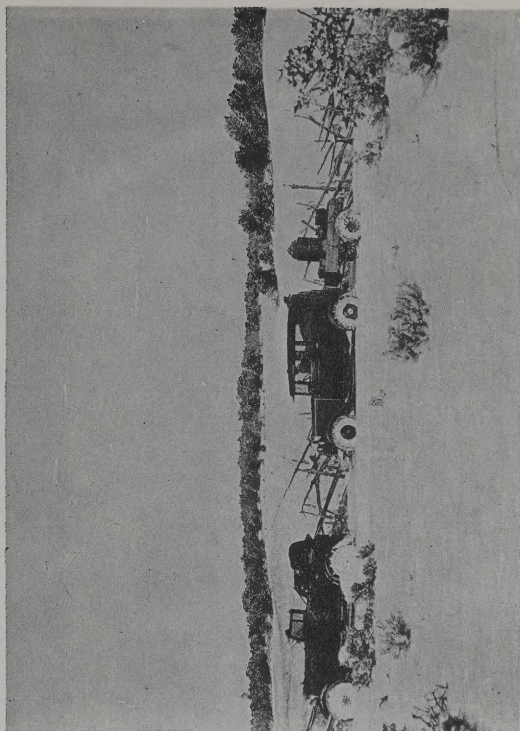
a



b

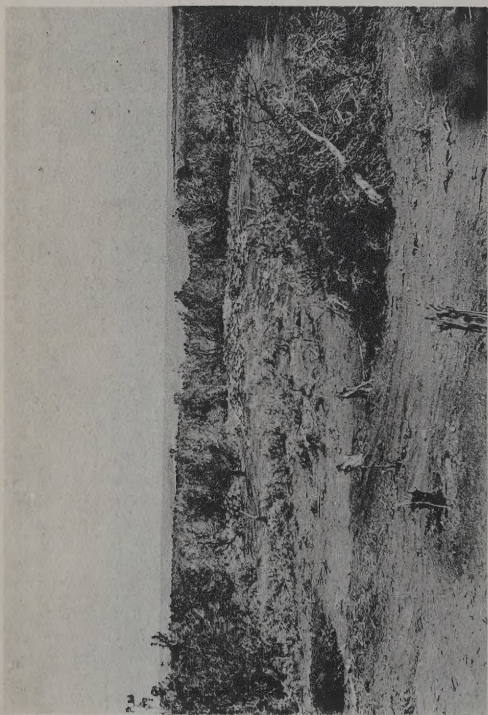


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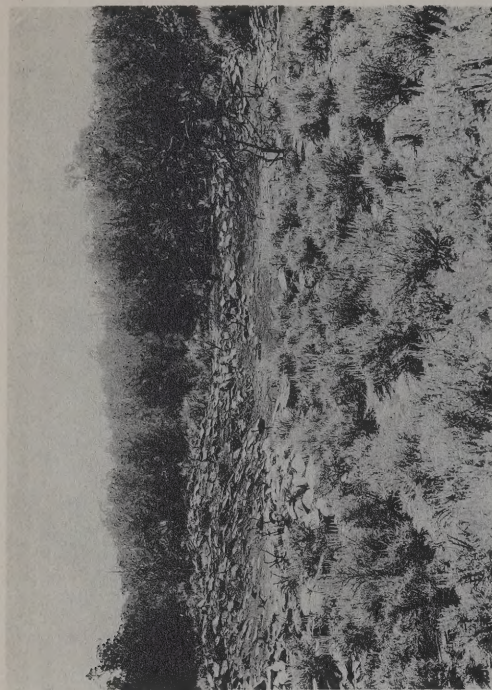


d

a, Alkali Ridge. Grassy glade with primroses in bloom. Abajo (Blue) Mountains in the distance. Site 6, a few yards to the right. b, Alkali Ridge. Side canyon west of Site 13. Mesa Verde Pueblo III site on mesa-top at extreme right. Abajo peak in the distance. c, the Blue Mountains from Monticello, Utah, Dec. 1, 1931. d, Alkali Ridge. The expedition cars on the way out from Camp 1, Nov. 30, 1931.



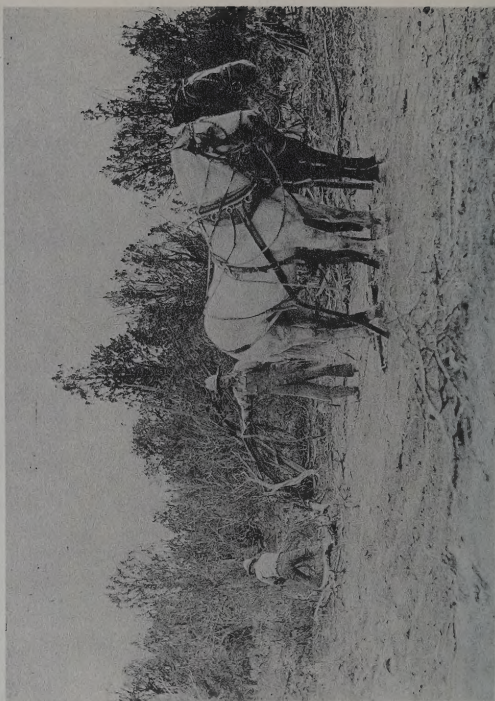
a



b

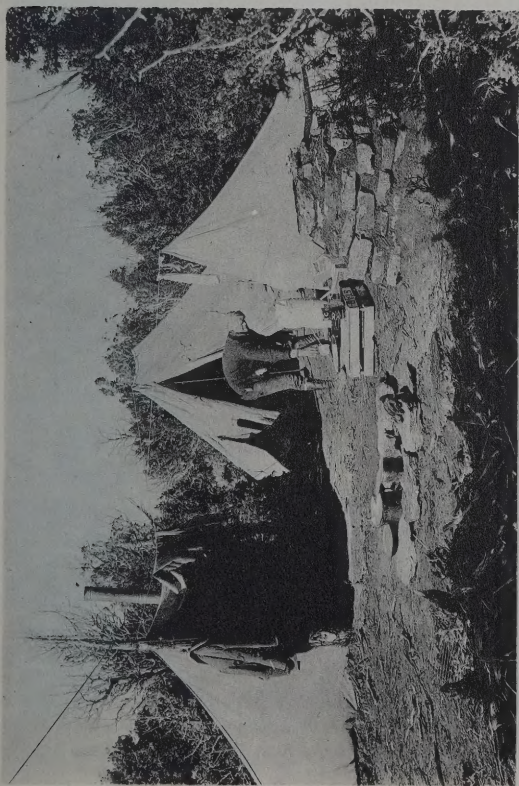
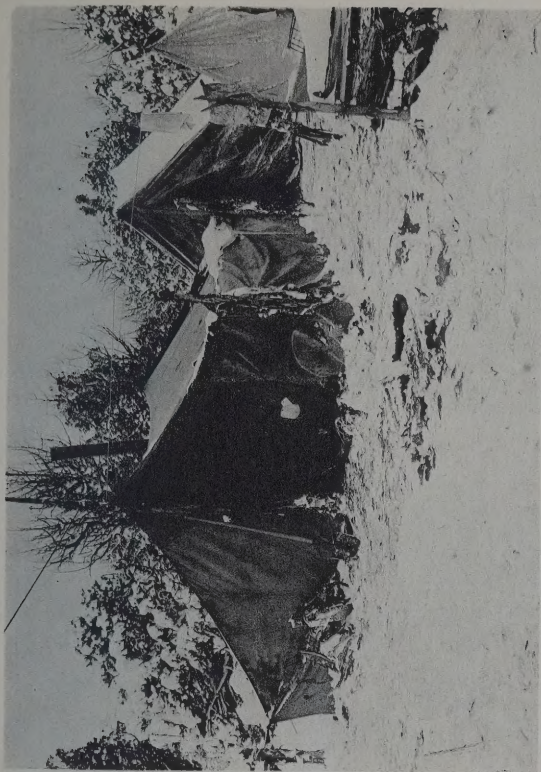
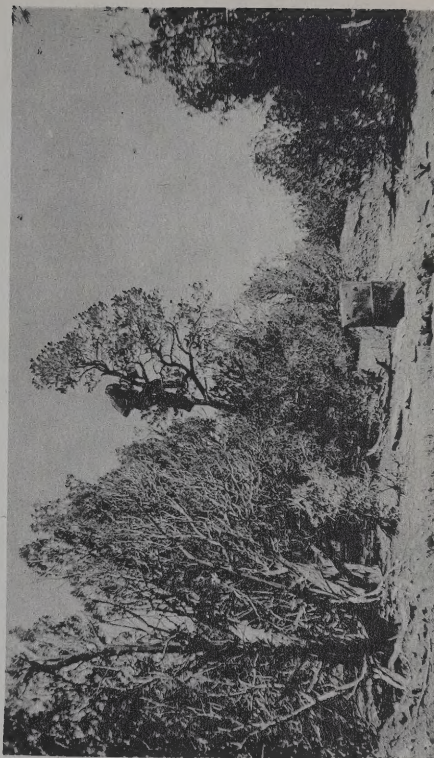


c



d

a, the northern section of Site 13 before excavation. The large mound of stones in the rear is the house of Pueblo III, Unit 3. The stones to be seen immediately behind the brush pile mark the house of Unit 1. The dirt pile on the left has been thrown out of Room 216; the tree at the left stands in Rooms 214 and 215; and the line of standing sage marks the north row of the Pueblo 1 storage chambers (see ground plan, fig. 27). Devils Canyon is in the distance. b, Site 1, double-kiva unit directly east of Unit 1. Sage has been burned off. c, Site 13, Pit House E, during excavation. The view looks southeast down Alkali Ridge and shows the juniper-pinyon forest. d, Site 13, clearing timber with chain and doubletree.

*a**c**b**d*

a, Alkali Ridge, Camp 1, 1931 season, first day. *b*, Alkali Ridge, Camp 1, 1931, subsequent days. *c*, Site 13, A. B. Stevens taking photograph of Room 100A and adjacent storerooms. *d*, Site 13, A. B. Stevens taking photograph of Room 100A and adjacent storerooms. Courtesy of S. C. Mills, Cahone, Colorado.

*a**b**c**d**e**f*

Site 1. The 6 recesses in the Unit 1 kiva. Note the range in the construction of the rear walls, from upright stone slabs in *a* to complete coursed-stone masonry in *c*. The rear wall of *f*, the southern recess, although fallen in, was apparently also of upright slabs. Note also: deflector slab and ventilator opening in *f*, pottery dishes on bench in *d* and *e*, and "floor-polishing stone" on bench in *a*. The pillars, made of larger stones, on right and left, are the pilasters which supported the base logs of a cribbed roof.



a



b

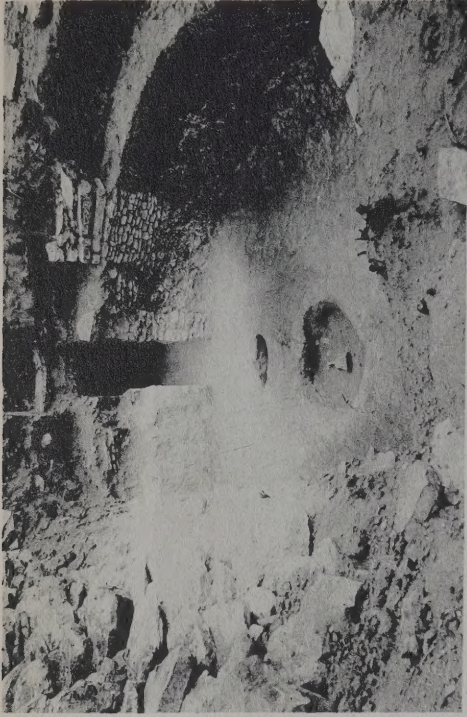


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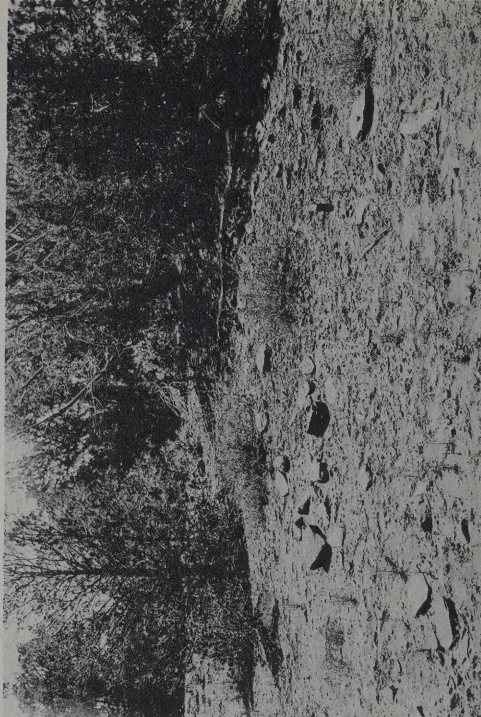


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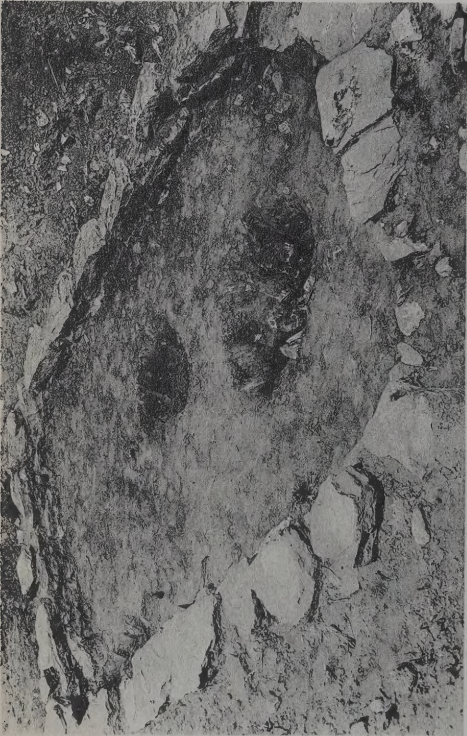
a, Site 1, Unit 1, kiva, showing sipapu, firepit, deflector, and ventilator in the north-south axis. To the right of the firepit are a stone vessel, containing charred beans, and fragments of pottery vessels crushed on the floor. Clay platters, containing ash, may be seen on the bench in 2 of the recesses. *b*, Site 1, Unit 1, Rooms 1, 3, and 4-
c, Site 2, kiva, showing charred fallen roof logs. *d*, Site 2, kiva, showing excavation for, and part of the structure, of the ventilator unit. Note the coursed-masonry deflector. The slabs on the floor of this kiva and in *a*, of similar shape and size, may have covered the roof-hole.



b



d

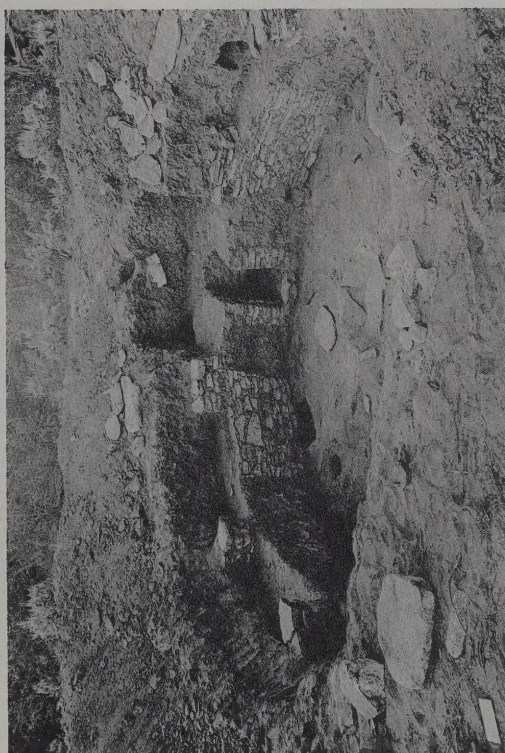


a



c

a, Site 5, House T, the only stone room at the site. The hole in the foreground is the opening to a cist. The hole in the center of the room is our test to determine that the earth beneath the floor was undisturbed. *b*, Site 5, Kiwa 2. Note slot for deflector slab south of firepit and coursed-masonry, under plaster, patching a cave-in of the native earth of the bench. The western plaster had fallen in and does not show in this picture. *c*, Site 7, kiva, built within a larger, earlier pit house. The line of the wall of the latter may be seen in the background. The floor of the pit house had been at approximately bench level of the later kiva. The outstanding differences between early and late Pueblo II kivas on Alkali Ridge are shown in *b* and *c* of this plate: the rectangular and expanding pilasters and the intersecting-tunnel and built-in types of ventilators. *d*, Site 9, the main house before excavation. The trees right of center are growing in Room B. The surface indications here are typical of Pueblo II jacal sites in the Mesa Verde region. There are often fewer stones about, however. Some of the objects seen are not stones but chunks of hard-burned adobe.

*a**b**c**d*

Site II. *a*, stone houses, B in foreground. *b*, kiva, painted plaster on kiva wall, 2 coats. The diagonal stripes are on the upper plaster layer. *c*, kiva. Coursed-masonry patches hold up the fill in old cists A and B; part of cist C can be seen in the rear left corner of the southern antechamber. The top of the vertical ventilator shaft can also be seen. Note the difference in construction between the 2 southernmost pilasters and the others, shown also in figure 88, *a*. *d*, kiva, showing wall painting and the settling of the adobe floor over the sub-floor channels. The large stone on the floor is probably the cover for the roof-hole. The small stone may have covered the small hole in the floor near it. A mano leans against the north wall.



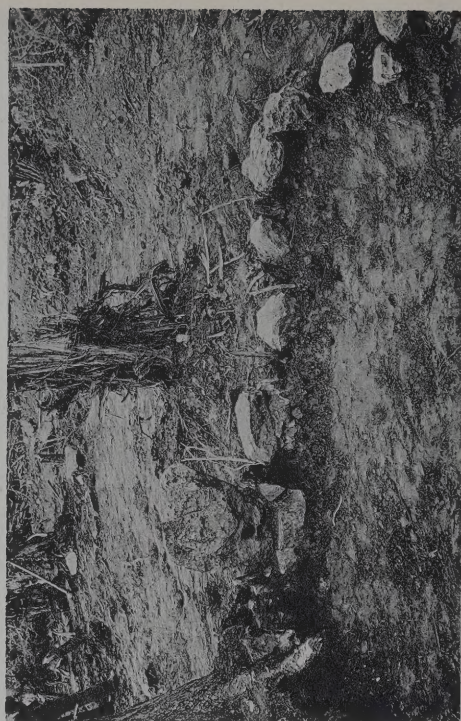
a



b

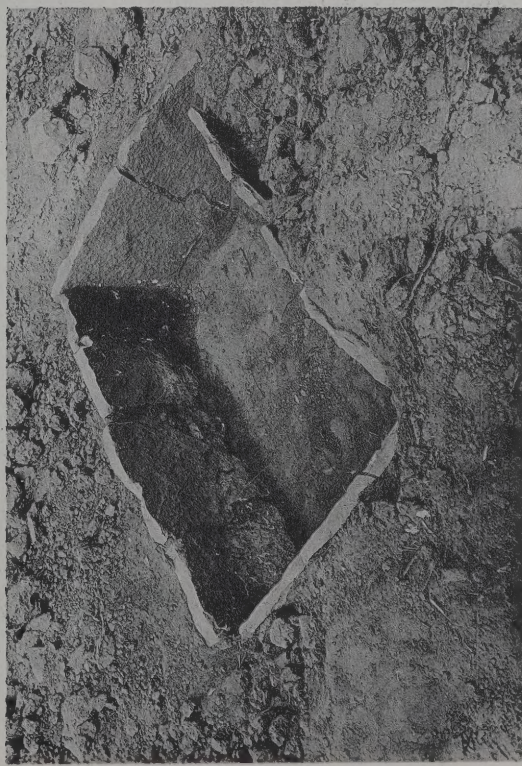


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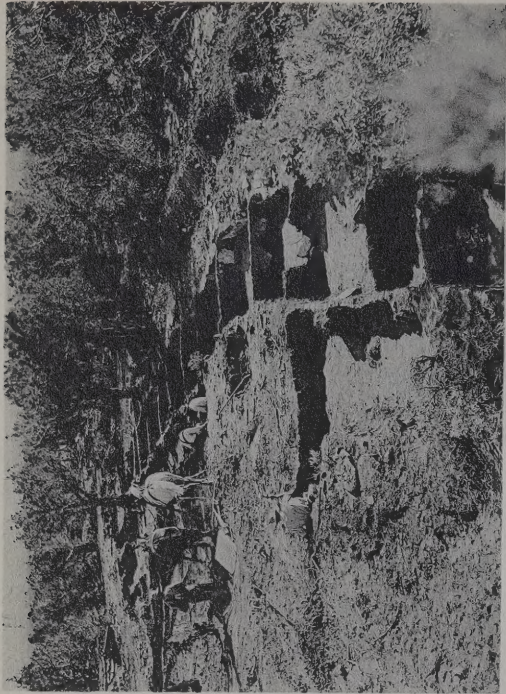


d

4, Site 12, kiva, with adobe floor removed to show sub-floor channels. Note tunnels from channels into firepit, blocked with stone-slab lining of firepit in final use. The tunnels are in undisturbed native earth which was left *in situ* when the floor was excavated for the installation of the channels. A large niche may be seen in the upper rear wall of the southwestern recess. b, Site 12, kiva, with old cists A and B partially cleared out. Note that the sub-floor channels were built on the fill in these cists. c, Site 12, the stone house. The men are testing beneath the floors. d, Site 12, Room G, south wall. Remains of posts may be seen between the stones. Note the 2 instances of superimposition of stones left of the center. In some of the Site 12 jacal walls, however, we found no stones at the base of the walls between the posts.

*a**c**b**d*

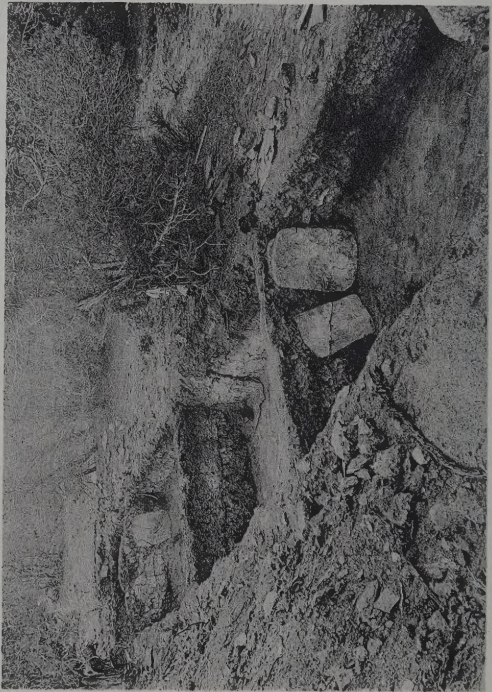
Site 12. *a*, Kiva 1. Slab in front of ventilator opening may have served to close that opening; or it may have been a deflector slab, although no slot for it was found in the floor. *b*, Kiva 2, southern room (U in fig. 23). The center opening is the ventilator; the corner openings are to cists S and T. *c*, stone box P, southwest of Kiva 1. *d*, pit N, southwest of Kiva 2.



a

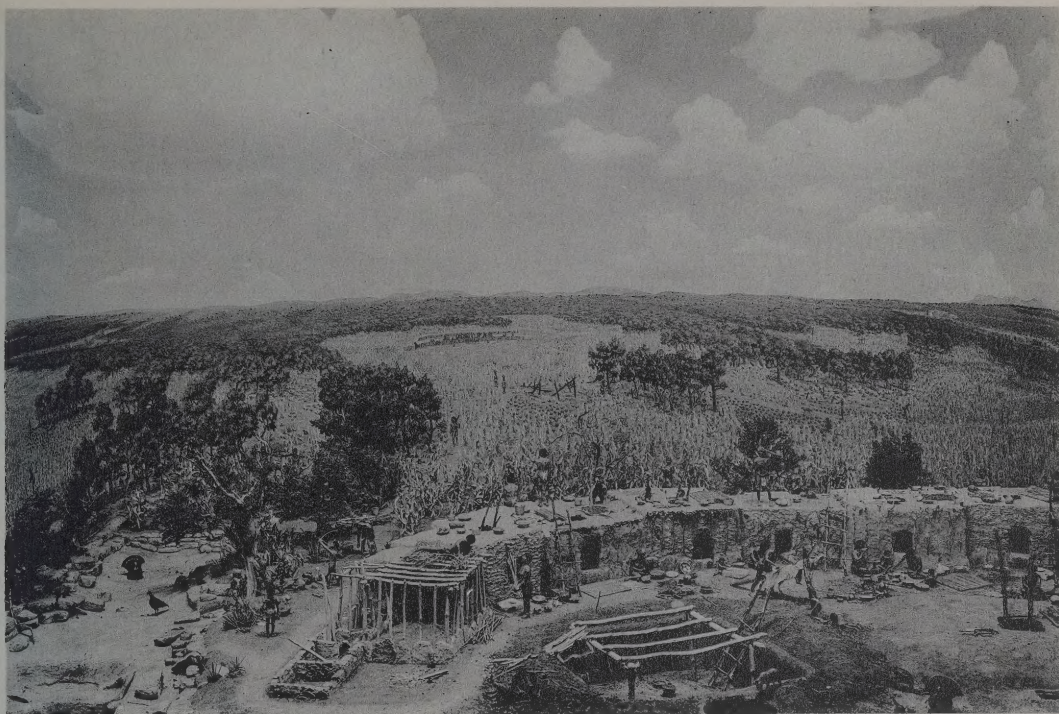


b



c

Site 13. *a*, looking south from Room 201, showing Rooms 109, 110, 111, etc. The dirt pile in the left background is at Pit House E. *b*, looking south from Room 216 during excavation. *c*, Rooms 102, 101, 100, and 99 before the excavation of Room 100A. Slabs leaning against the walls may be door slabs. *d*, same as *c*, after excavation of Room 100A. Most of the stones visible in 100A are metates (see fig. 174, *e*).

*a**b*

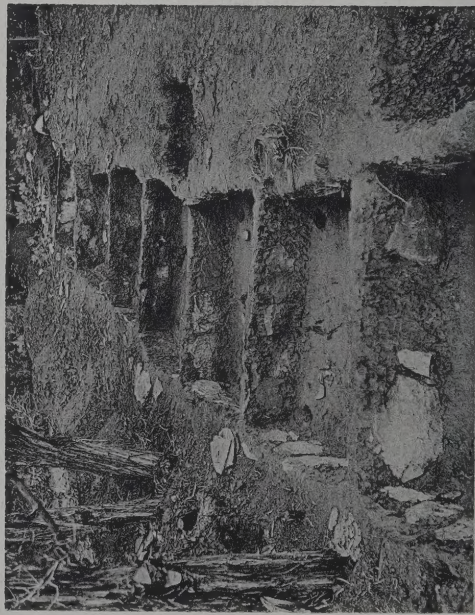
a, "Developmental Pueblo" diorama in the Museum at Mesa Verde National Park. Many of the features shown are similar to those at Site 13. (Courtesy of the United States National Park Service.) *b*, Site 13, Room 100A. Note firepit. The stone-and-adobe construction against the wall of Room 101 (center) may be a stoop for a raised doorway into the storeroom.



a



b



c



d

Site 13. *a*, south wall of Room 101 with 100A in background. The rippling in the wall plaster was made with the fingers. Note the 2 wall plugs which are shown removed in *b*. *b*, Room 101. Plaster on north side of wall plugs removed; the stone plug also removed and lying on floor in front of it; the stone-slab plug of the large hole is still in place as is the plaster on the south side. The construction against the south wall, possibly a stoop (shown in fig. 91, *b*), is on the other side of the large plug. It seems likely that the floor-level doorway was replaced by one higher in the wall. *c*, storerooms, looking north from Room 245 before excavation of the living rooms. *d*, Unit 1, Room U₂, showing large Pueblo II corrugated jar which had been set in the floor.



a



b

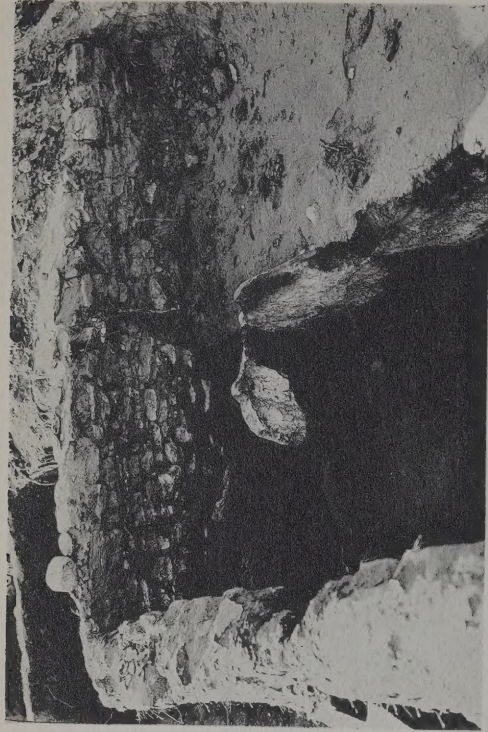


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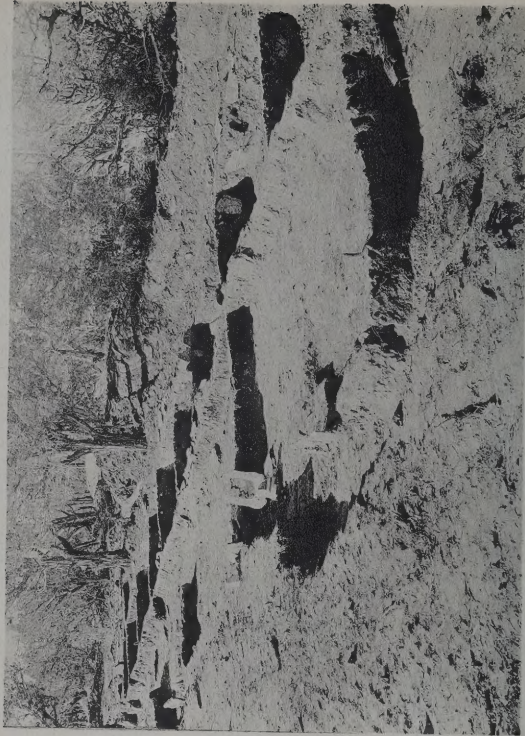


d

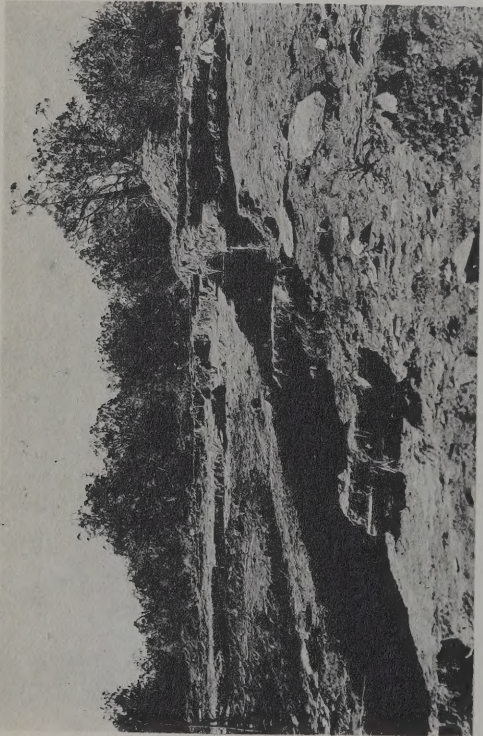
Wall types in the Pueblo I storerooms of Site 13. *a*, Type I: upright slabs, heavily plastered, above which are alternating courses of slender stones and adobe. The latter is often in the form of "turtlebacks." Room 75 is shown here with the plaster removed in part from one of the slabs in the north wall. The lower stone course in the upper wall remained *in situ*. Note the holes for corner-posts. *b* Type III: same as Type I except that the upright slabs are omitted and the alternate courses of stone and adobe begin at the base of the wall. This is a close approximation to true coursed masonry. Room 5 is shown here. The north wall is Type III, but note that the west wall (left) is built of upright posts and adobe (Type IV). *c*, Type II: similar to Type I but with 2 tiers of upright slabs at the base. Room 2 is shown here with part of the wall plaster removed to expose the slabs. *d*, Type IV: jacal walls of upright posts and adobe mud. Rooms 108 and 109, shown here, unlike most of the rooms at Site 13, had not been burned, so that the jacal walls presented a much different appearance than usual upon excavation.



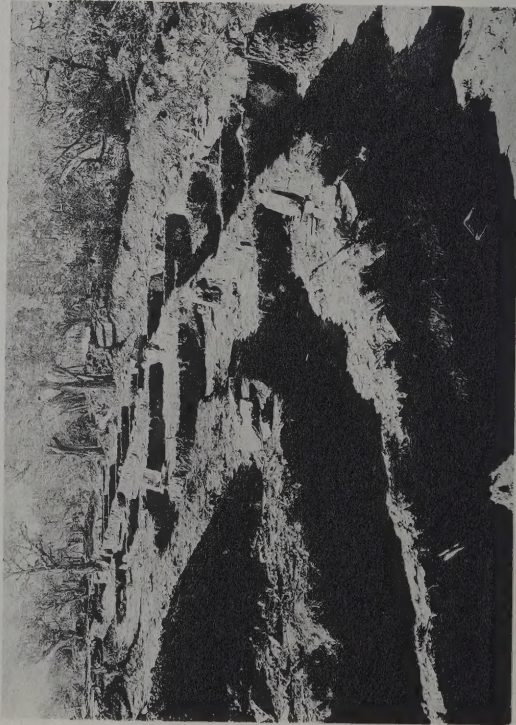
b



d

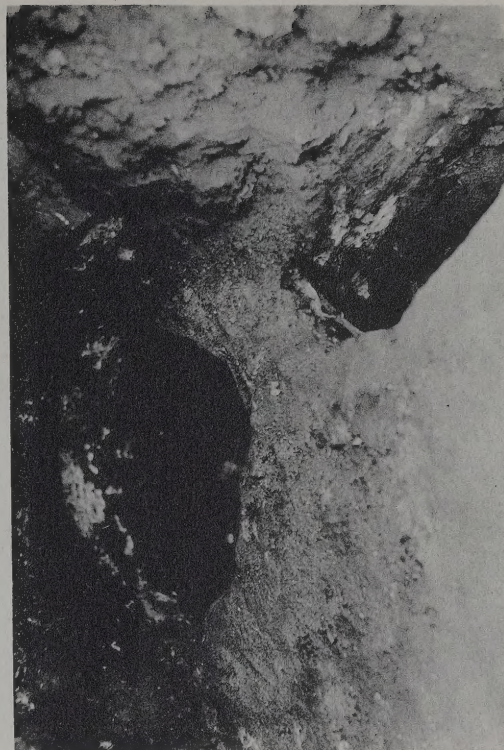


a



c

Site 13. *a*, view of the north row of storerooms from Room 199, showing the Unit 1 house built on top of the old rooms. *b*, Unit 1, Room U1, showing Pueblo I Rooms 208 and 209 underneath. *c*, northern section of the north-south row of the Pueblo I village, showing living rooms 218A, etc. *d*, Rooms 220A and 222A with adjacent storage rooms. Note deflector and firepit in 220A (center).

*a**b**c**d*

Site 13, Pit House B. *a*, Pit House B, showing south end, continuous partition wall with doorways, and part of the main room. Note holes for wall posts in the main room and grinding stones in the south end. *b*, Pit House B, showing southern ante-chamber in the background. One of the 4 roof-support posts may be seen in the ante-chamber. *c*, Hole G in floor, excavated in the bedrock. The rectangular section is slab lined. *d*, Hole N in floor, in the bedrock.



b



d

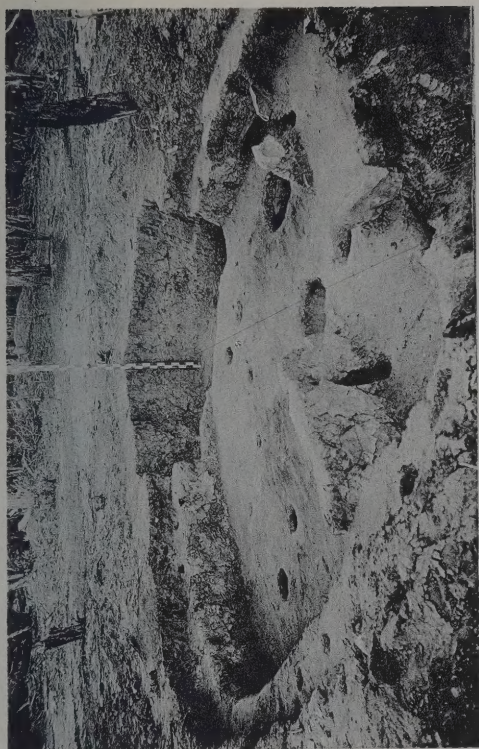
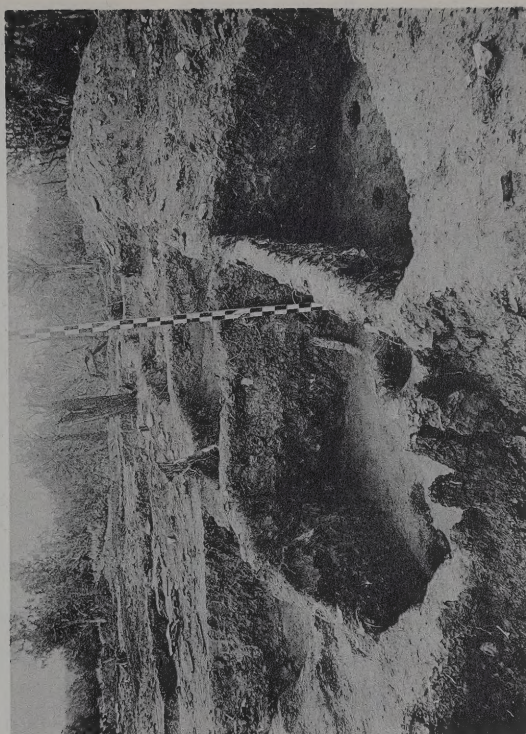


c



a

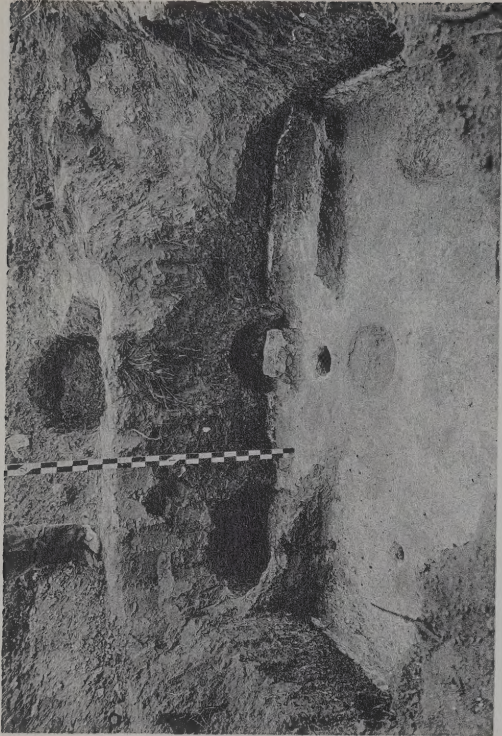
Site 13, Pit Houses. *a*, Pit House D, showing burial near floor. The skull was deformed. There were no grave furnishings. *b*, Pit House E, showing continuous partition with doorways, south end, and southern antechamber. Note holes for wall posts in main room. *c*, Pit House F. The marks on the wall at the rear are made by the digging sticks used by the original excavators. While the room was in use, these walls had been covered with adobe plaster. *d*, Pit House G. Note vestigial southern antechamber and metate used as a deflector. One of the 4 roof-support posts may be seen incorporated in the right wing wall to the right of the slab.

*a**b**c**d*

Site 13, the earlier Pit houses. *a*, Pit House H, showing the relatively large south end and even larger southern antechamber in the background. The position of the roof-support posts in the wing walls is clearly shown, although the posts themselves have gone. *b*, Pit House H, showing the bench in which wall posts were set and excavation M in the northeast corner. *c*, Pit House I, showing the superimposition of later Rooms 14, 15, and 15A. *d*, Pit House K, showing the superimposition of later Rooms 6 and 12. The firepit of the pit house is in the center of the picture, and the end of the western wing wall may be seen beyond the firepit projecting from the fill beneath the wall dividing Rooms 6 and 12. The stadia-rod in these photographs is divided into 10-centimeter units.



a



b



c



d

Site 13, Pit houses. *a*, Pit House J. Note the tunnel in place of the passageway. Only vestiges of the wing walls remain, but the holes for the roof-support posts which were incorporated in them are plainly shown. *b*, Pit House L. Note the small ventilator tunnel with a deflector slab close to its mouth. This opening could not possibly serve as an entrance. The excavation beneath the surface of the bedrock, which is a characteristic feature of Alkali Ridge subterranean structures, shows plainly in this photograph. *c*, Room 214, pottery *in situ* during excavation. *d*, Room 241, pottery *in situ* during excavation. The small dark-colored objects on the left are charred pinyon nuts which had been contained in a Lino Gray jar. The stadia-rod in *a* and *b* is divided into 10-centimeter units.

FIGURE 99

POTTERY VESSELS FROM SITE 13, ALKALI RIDGE, PUEBLO I LEVELS. Typologically these pots would be classed as Basket Maker III and Pueblo I. The wares are Lino Gray, Kana-a Gray, and Abajo Red-on-orange. *w* is 20 cm. high.

PROVENANCE AND WARE

FIG. NO.	LOCATION IN SITE 13	WARE	FIG. NO.	LOCATION IN SITE 13	WARE
99, <i>a</i>	Room 14A	Lino Gray	99, <i>t</i>	Room 212A	Lino Gray
<i>b</i>	" 218	" "	<i>u</i>	" 220A	Abajo Red-on-orange
<i>c</i>	" 200A	" "	<i>v</i>	" 297	" " " "
<i>d</i>	" 302	" "	<i>w</i>	" 214	Lino Gray
<i>e</i>	" 104	" "	<i>x</i>	" 218A	Abajo Red-on-orange
<i>f</i>	E. of Pit House A	" "	<i>y</i>	" 100A	" " " "
<i>g</i>	Pit House M, lower fill	" "	<i>z</i>	" 10	" " " "
<i>h</i>	Room 100A	" "	<i>aa</i>	" 99A	" " " "
<i>i</i>	" 220A	Abajo Orange	<i>bb</i>	" 100A	" " " "
<i>j</i>	" 99	Lino Gray	<i>cc</i>	Pit House A, near floor	" " " "
<i>k</i>	" 100A	" "	<i>dd</i>	Room 302	" " " "
<i>l</i>	" 220A	" "	<i>ee</i>	Pit House B, floor	" " " "
<i>m</i>	Pit House B, floor	" "	<i>ff</i>	" " G, "	" " " "
<i>n</i>	Room 242A	" "	<i>gg</i>	Room 113	" " " "
<i>o</i>	" 242	" "	<i>hh</i>	" 75	" " " "
<i>p</i>	" 220A	Kana-a Gray	<i>ii</i>	" 99A	" " " "
<i>q</i>	" 99A	" "	<i>jj</i>	" 213	" " " "
<i>r</i>	" 302	" "	<i>kk</i>	" 17A	Lino Gray
<i>s</i>	" 297	" "	<i>ll</i>	" 240A	Lino painted

NOTES

a-d and *f-i*, miniatures. *e*, problematical object resembling a clay model of a Basket Maker carrying-basket. *f*, miniature "duck-pot." *b*, *c*, *h*, *j*, *t*, *aa*, *cc*, *ff*, and *ll*, globular jars without necks, one of Guernsey's Basket Maker III diagnostics. *k*, *o*, and *w*, pitchers. *l*, crude bottle. *m*, small standard jar (see fig. 100). *n*, plain gray jar with nodules. *p-s*, banded-neck jars with unsmoothed, superimposed circular fillets (not spiral), one of the most common ceramic diagnostics of Pueblo I, rare, however, in southeastern Utah. *u*, *v*, *x*, and *y* show the broad, shallow form of Pueblo I bowls to be compared with the Pueblo II bowls in fig. 111. *bb* is a cup, perhaps the original Mesa Verde mug. Jar, *dd*, has lugs pierced through the body of the pot rather than just through the lug, the usual custom, as in *z*. *ee*, so-called "two-story" vessel, the upper section being originally of size similar to lower; the present rim is merely a retouched fractured edge (see fig. 52, *l*, for conjectural reconstruction). *gg*, neck of a large painted jar. *hh*, small bottle. *ii*, *jj*, "squash" bottles whose necks originally curved back down toward the bodies. The probable location of the orifice is shown by dotted line on restored section of *ii*; the neck of *jj* has been broken off below that point, the fractured edge rubbed smooth, and 2 holes bored in the neck. *kk* is a standard "duck-pot"; note wing; broken rear portion probably sported a tail. *ll* is a globular jar made of Lino ware but with a design in red in part superimposed on a design in black paint, see p. 272 (for early true polychromes, see fig. 101).

Drawings of designs on *z*, *aa*, *bb*, *ee*, *gg*, *ii*, *jj*, and *ll* will be found in figure 52, page 260 and a better picture of *e* in fig. 175, *a*.



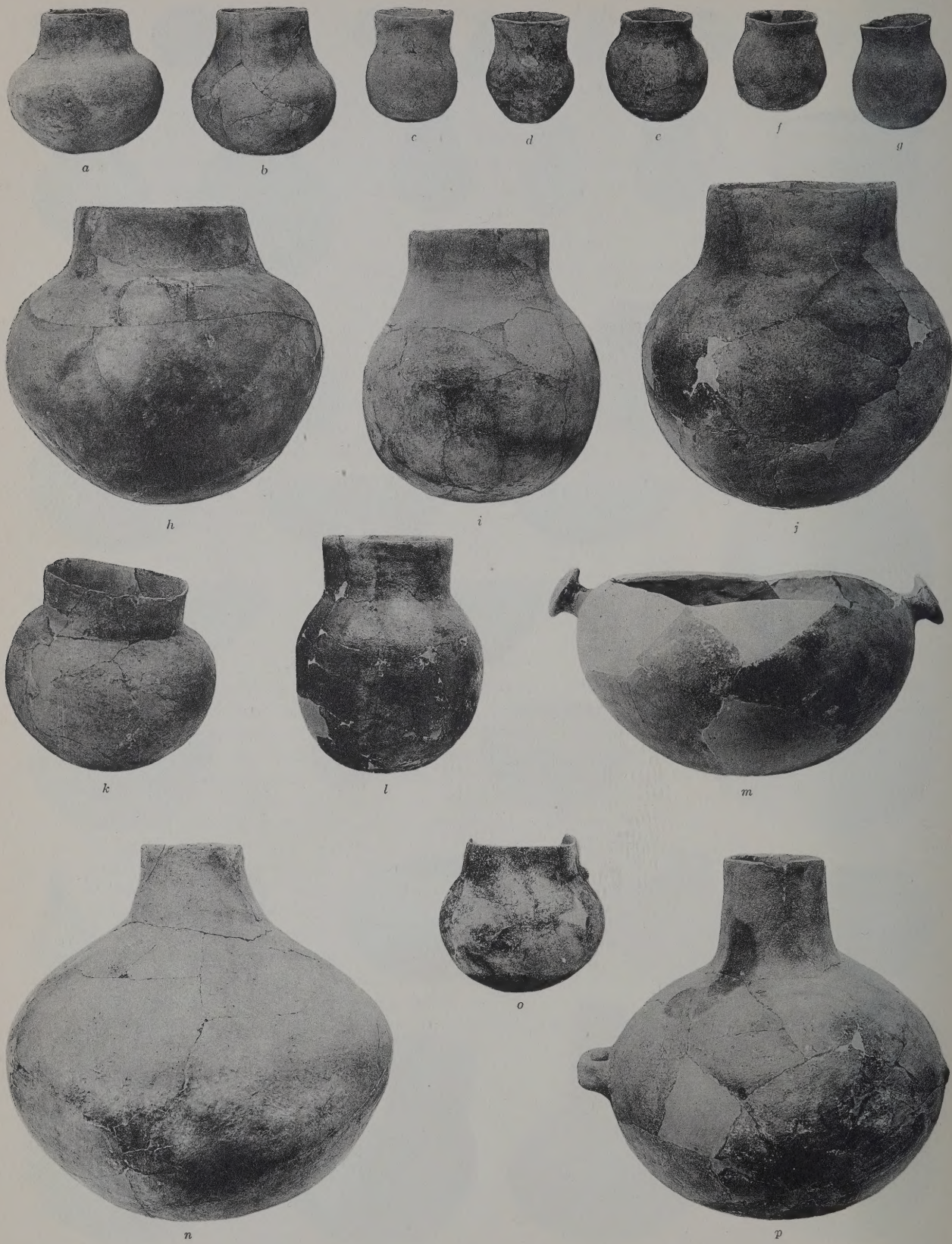


FIGURE 100

POTTERY VESSELS OF LINO GRAY WARE FROM PUEBLO I LEVELS AT SITE 13, ALKALI RIDGE, except for *d* which is a Pueblo II plain gray jar from Site 12. Strict application of defined Southwestern ceramic taxonomy would result in a Basket Maker III label for all of these except *d*, which does not have the Lino paste. However, the unsmoothed neck-bands, the formal diagnostic of Pueblo I gray ware, is rare in southeastern Utah. The painted pottery found in association with this gray ware is Abajo Red-on-orange. *i* is 28.6 cm. high.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
100, <i>a</i>	13	Room 214	100, <i>i</i>	13	Room 100A
<i>b</i>	13	" 100A	<i>j</i>	13	" 297
<i>c</i>	13	" 202	<i>k</i>	13	Pit House A, near floor
<i>d</i>	12	Kiva 1, bench	<i>l</i>	13	Room 106
<i>e</i>	13	Room 223	<i>m</i>	13	surface
<i>f</i>	13	" 114	<i>n</i>	13	Room 6
<i>g</i>	13	" 99	<i>o</i>	13	" 99A
<i>h</i>	13	" 113	<i>p</i>	13	" 222A

NOTES

a-l, except for *d*, are standard unpainted jars (Roberts' "globular jars with necks"). These were the most common vessels at Site 13. Note the rounded bottoms and relatively short necks. The specimens presented here were selected to show size range and variety of shoulder angle; for miniatures, see fig. 99. In *l* the banded fillets of clay in the neck are not completely obliterated. *m* is the lower part of a large jar similar to *n* and *p*. Note the wrap-around lugs on *m*; *n* has no handles; and *p* had 2 heavy horizontal strap-handles, one of which has broken off. *o* has 2 small non-perforated lugs at the base of the neck.

GENERAL NOTE FOR ARTIFACT FIGURE LEGENDS

The pages on which the various illustrated objects are described and discussed are not given in the legends. The index, however, is sufficiently detailed to give the pages for descriptive material in most cases under the headings: pottery, stone artifacts, and bone artifacts.

FIGURE 101

ALKALI RIDGE POTSDHERDS. *a-n*, polychromes from Pueblo I levels at Site 13. *o-v*, selection showing color variation and gradation in the Abajo dichrome from bright red-on-orange to black-on-gray. *w-cc* are unusual sherds described below from Pueblo I and Pueblo II levels on Alkali Ridge. The max. width of *a*: 6 cm.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
101, <i>a</i> *	13	Room 107	101, <i>p</i> *	13	Room 201
<i>b</i> *	13	Pit House H, fill	<i>q</i> *	13	" 111
<i>c</i> *	13	Pit House H, cist M, fill	<i>r</i> *	13	" 99
<i>d</i> *	13	Room 215	<i>s</i> *	13	Pit House H, S. antechamber, fill
<i>e</i>	13	Pit House B, floor	<i>t</i> *	13	Room 108
<i>f</i>	13	Room 247	<i>u</i> *	13	" 200
<i>g</i>	13	Pit House E	<i>v</i> *	13	" 117
<i>h</i> *	13	Unit 1, refuse	<i>w</i> *	13	Pit House N
<i>i</i>	13	Pit House I	<i>x</i>	13	floor, pit beneath Room 201
<i>j</i>	13	Room 111	<i>y</i> *	—	site E. of Black's Spring
<i>k</i> *	13	" 101	<i>z</i> *	9	refuse mound
<i>l</i>	13	Pit House B	<i>aa</i>	—	from same vessel as <i>y</i>
<i>m</i>	13	" " F, fill	<i>bb</i> *	13	Pit House K
<i>n</i> *	13	Room 111	<i>cc</i>	11	area N.E. of houses
<i>o</i>	13	" 238			

* Denotes rim sherd.

NOTES

With the exception of *m*, the polychromes, *a-n*, are lumped for the present under the term Abajo Polychromes. That there is considerable variation, however, may be seen even in the illustrations. The black paint is not uniform; and *b* is polished over the paint while *f* is not. Yet, as a group, they represent early experiments in the production of polychromes. We found only 2 others, too small to show, in the Pueblo I levels. A whole bowl is shown in color in Morris, 1939, plate 1. *d* was discolored in a granary fire and comes from the same pot as the vitrified sherd, fig. 110, *r*.

m is perhaps an accident, a paint difference between the framing lines and the filler in large design elements, a trait found in Mesa Verde Pueblo III as well (see fig. 169, *a*).

o through *v* are sherds selected to show color variation and gradation in Abajo Red-on-orange from Pueblo I levels at Site 13. For color dictionary listings, see table 9, p. 262. *v*, at the bottom of the series, is a true black-on-gray, a very rare occurrence, well under 1% of the decorated pieces. In *u*, which is entirely black-on-gray on the interior surface, orange shows along the fractured edge and on part of the exterior. Abajo Red-on-orange pieces sometimes have gray "firing-clouds" on the painted surface. The exteriors of bowls very often have such markings; some are entirely gray.

w is a unique specimen with negative painting found in a Pueblo I level. The indefinite nature of the borders of the dots and the 2 bands indicates that a resist technique was used.

x and *bb* are made of Lino gray paste: *x* has a design in black paint and an all-over coating of fugitive red. It was found in an old pit which probably preceded Abajo times at Site 13. *bb* is a rim sherd of a Lino bowl with a design in red.

y-aa and *cc* are Pueblo II polychromes in the Mancos wares. *z*, a rim sherd from a jar neck or cup, and *cc* used the unpainted gray color of the paste for the third color. *y* and *aa*, sherds from a single bowl, have a light blue-gray paint along with the black-on-white.





FIGURE 102

ABAJO RED-ON-ORANGE POTTERY FROM PUEBLO I LEVELS AT SITE 13. The run-of-the-mill decorated ware of Alkali Ridge and other southeastern Utah mesas. The usual Pueblo I black-on-white wares were not found at Site 13. And the ratio between the red-on-orange and the surviving or intrusive Basket Maker III black-on-whites of figure 103 is better than 1000 to 1. Yet until Site 13, with its surface covered with these sherds, was found we believed we were in the heart of a "strictly black-on-white" region.

The similarity of the orange background to the orange base color of the Tusayan red wares of northeastern Arizona is obvious. It is probable that the Tusayan, Tsegi, and Kayenta orange wares developed out of Abajo or some similar ware on the Arizona side of the San Juan.

Max. diam. *n*: 22 cm.

PROVENANCE

FIG. NO.	LOCATION IN SITE 13
102, <i>a</i> *	Pit House H, main room, fill
<i>b</i>	Room 208, fill, under Room U1
<i>c</i>	Pit House G, upper fill
<i>d</i> *	" " E, fill
<i>e</i>	Room 240A
<i>f</i>	" 101
<i>g</i>	" 301

FIG. NO.	LOCATION IN SITE 13
102, <i>b</i> *	Pit House G, fill
<i>i</i>	" " C, fill
<i>j</i> *	Room 220
<i>k</i>	Pit House G, fill
<i>l</i> *	Room 302
<i>m</i> *	" 113
<i>n</i>	pit S. of Room 201
<i>o</i> *	Pit House H, main room, fill

* Denotes rim sherd.

NOTES

Bowls and bowl sherds except *d*, part of a jar with very slight shoulder, and *m*, *o* which are necks of large "water jars." Note lugs on *m*; they are pierced vertically. Color is discussed on pages 259 and 261 and variations are listed in table 9, p. 262.

FIGURE 103

BASKET MAKER III BLACK-ON-WHITE POTSDHERDS FROM ALKALI RIDGE. Lino and La Plata Black-on-white wares. *cc* could be classified as Pueblo I East (Kiatuthlanna) Black-on-white. Max. width of *a*: 5 cm.

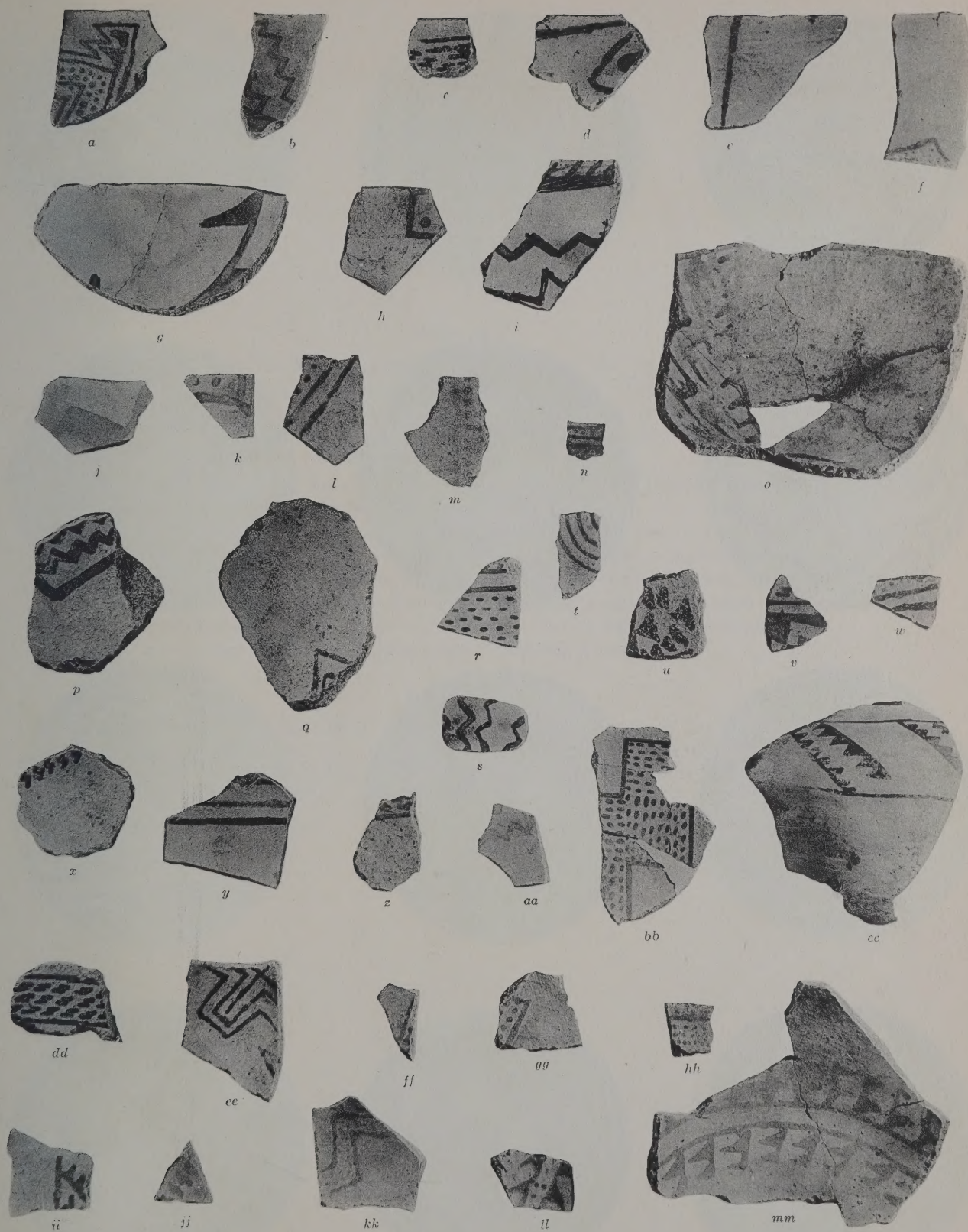
PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
103, <i>a</i> *	13	Pit House I, floor	103, <i>t</i>	13	Pit House G, fill
<i>b</i> *	13	" " E, fill	<i>u</i>	13	Room 209, top fill
<i>c</i> *	13	Room 303	<i>v</i>	13	Pit House G, fill
<i>d</i> *	13	Pit House H, fill, cist M	<i>w</i>	13	Room 16
<i>e</i> *	13	Room 242A	<i>x</i>	13	Pit House I, fill
<i>f</i> *	13	" 14A	<i>y</i>	13	Room 125
<i>g</i> *	13	" 207	<i>z</i>	13	" 73
<i>h</i> *	13	" 245A	<i>aa</i>	13	Pit House D, top fill
<i>i</i> *	13	S. of Room 100A	<i>bb</i> *	13	" " C, S. antechamber
<i>j</i> *	13	Pit S. of Room 201	<i>cc</i>	13	Room 208, fill, under room U1
<i>k</i> *, <i>l</i> *	13	Pit House E, fill	<i>dd</i> *	7	kiva, roof debris above floor
<i>m</i> *	13	Room 2	<i>ee</i>	2	Room B, under masonry house, 60 cm. below surface
<i>n</i> *	13	Pit House N, top fill	<i>ff-bb</i>	2	refuse mound, west end
<i>o</i> *	13	" " K, S. end, near floor	<i>ii</i>	7	kiva fill
<i>p</i>	13	Pit House E, fill	<i>jj</i>	7	kiva, roof debris above floor
<i>q</i>	13	Room 111	<i>kk</i>	7	kiva fill
<i>r</i>	13	Pit House M, fill	<i>ll</i>	2	N. of houses
<i>s</i>	13	" " N, lower fill	<i>mm</i> *	7	kiva fill

* Denotes rim sherd.

NOTES

c, *x*, *z*, and *dd* show design called "basket-stitch" by Morris, who considers it to be derived directly from basket decoration in the San Juan. It also occurs on Hohokam pottery and has been presented as evidence that Basket Maker pottery was derived from Hohokam. One possibility, which all evidence supports and which seems reasonable, is that this is one of a group of designs for the decoration of baskets which were spread about the Southwest before the advent of pottery. Other designs which may have been diffused before pottery may be observed by comparing this plate with the basket designs shown in fig. 67 and the Abajo pottery designs in figs. 52-66. *s* is a re-used sherd. The 39 sherds shown here plus the 11 additional sherds in figs. 106-107; the 2 bowls in fig. 52, *s*, *t*; the bowl fragment, fig. 191, *g*; and 37 sherds which did not show enough design to merit illustration; a total of 90 pieces, are all the specimens classifiable as Basket Maker III black-on-white found in the Alkali Ridge excavations.

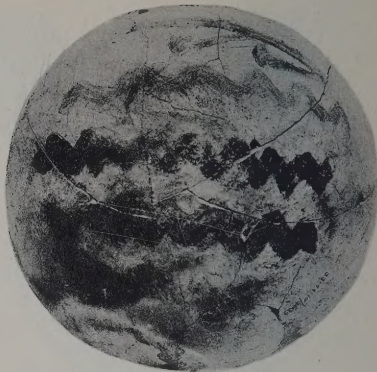




a



b



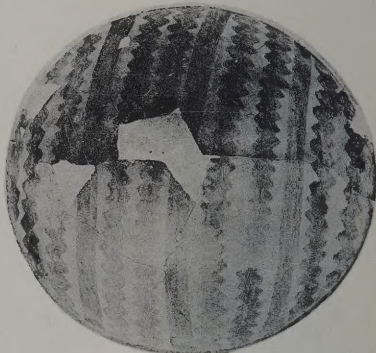
b'



c



d



e



f



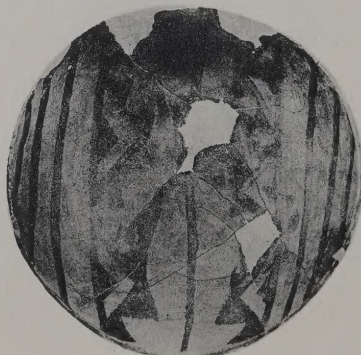
g



h



i



j



k

FIGURE 104

ABAJO RED-ON-ORANGE BOWLS FROM PUEBLO I LEVELS, SITE 13. The designs are in red paint applied to an unslipped orange background on bowl interiors. *b'* shows the only decoration found on the exterior of an Abajo bowl and may be attributable to brush testing. The prevailing color and color range are shown in figs. 101 and 102. The rims, which in most cases are flat, are usually painted red, sometimes unpainted.

The broad wavy line in *a*, *b*, and *e* is the most common Abajo element. Drawings of these and other Abajo bowl designs may be seen in figs. 53-66 in the text.

Abajo bowls are widest at the lip. Diameters of those shown here run from 17.5 cm. (*f*) to 25 cm. (*a*, *g*). Ordinarily, as in fig. 99, photographs of whole specimens are reproduced with a single scale for a single plate in order to permit rapid comparison of size. However, when the objective, as in this case, is to show bowl designs, and particularly when the size range is small, the most useful procedure seemed to be to reduce all bowls to a standard size, the same procedure in fact as that followed in the presentation of drawings of bowl designs.

PROVENANCE

FIG. NO.	LOCATION IN SITE 13	FIG. NO.	LOCATION IN SITE 13
104, <i>a</i>	Room 108	104, <i>g</i>	Room 100A, fill
<i>b</i>	Pit House B, floor	<i>h</i>	Pit House G, floor
<i>b'</i>	exterior of <i>b</i>	<i>i</i>	Room 220A
<i>c-e</i>	Room 218	<i>j</i>	" 296
<i>f</i>	" 220A	<i>k</i>	pit S. of Room 201

FIGURE 105

ABAJO RED-ON-ORANGE BOWLS FROM PUEBLO I LEVELS, SITE 13. (See legend, fig. 104.) *c*, with a lip diameter of 34 cm., is unusually large for an Abajo bowl. The others range from 19.5 cm. (*e*) to 26.5 cm. (*l*).

PROVENANCE

FIG. NO.	LOCATION IN SITE 13	FIG. NO.	LOCATION IN SITE 13
105, <i>a</i>	Room 297	105, <i>g</i>	Room 82A
<i>b</i>	" 218A	<i>h</i>	" 106
<i>c</i>	" 75	<i>i</i>	" 100A
<i>d</i>	" 214	<i>j, k</i>	" 297
<i>e</i>	" 297	<i>l</i>	" 218A
<i>f</i>	Pit House B, floor		

NOTES

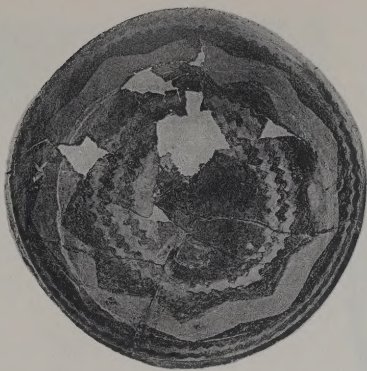
In fig. 67 (p. 268); 175, *f, g*; and fig. 191, *e, h*, photographs and drawings of Basket Maker II and III baskets are presented for comparison with Abajo pottery designs. Compare particularly the spiral rows of wavy-based triangles in *e* with fig. 67, *h, k*. Note also resemblances of treatment between *g, h* and fig. 67, *f, c*.

a and *d*, as well as some other Abajo specimens (see figs. 53-56, p. 263), also present striking resemblances to the simpler designs of the Dragoon Red-on-brown of southeastern Arizona shown in Fulton and Tuthill, 1940, fig. 3.

Comparison with pottery designs of the next phase on Alkali Ridge, Pueblo II, yields few immediately striking parallels. The large checkerboard patterns of *j* and *k* are certainly similar to figs. 72, *a, b* and 124, *a, b, c*. A broad wavy line occurs on one Pueblo II piece, fig. 151, *o*. For the most part, however, Pueblo II design treatment on Alkali Ridge was much lighter, with finer lines and smaller figures than that of Pueblo I. The only consistent exception seems to be in the terraced figures (see fig. 134).



a



b



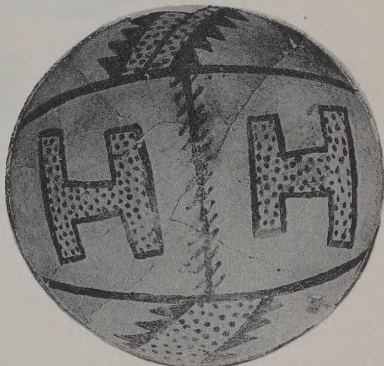
c



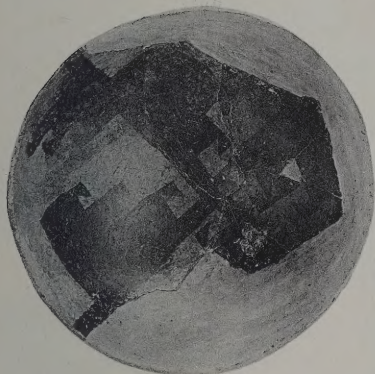
d



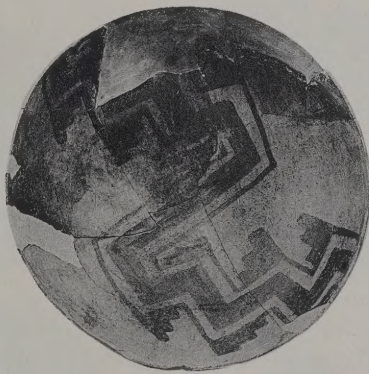
e



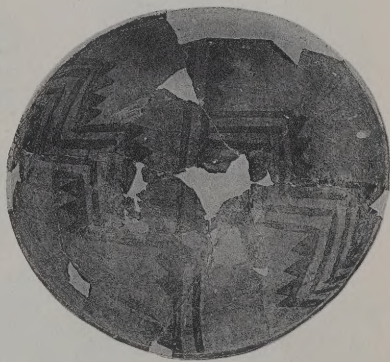
f



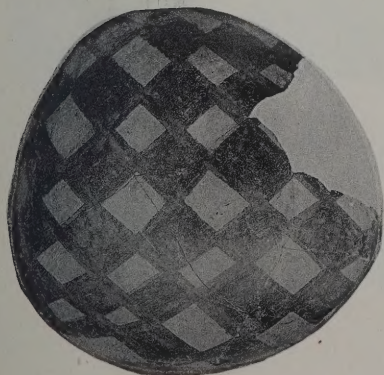
g



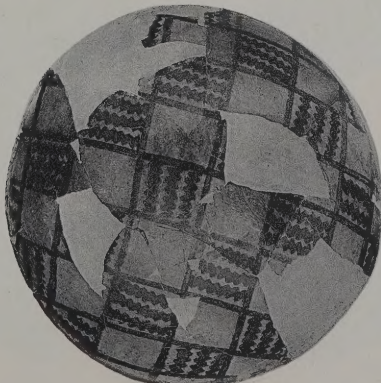
h



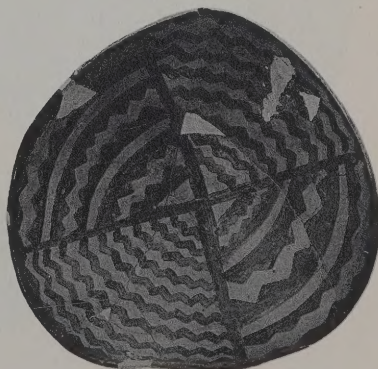
i



j



k



l

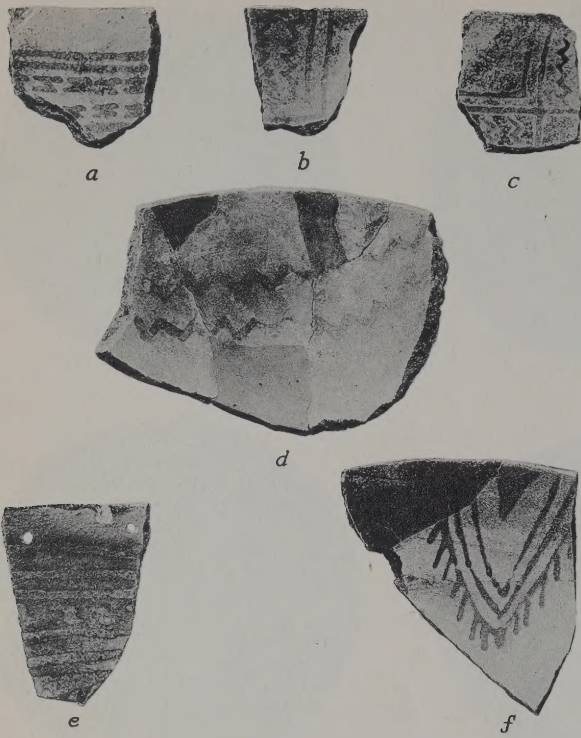


FIG. 106

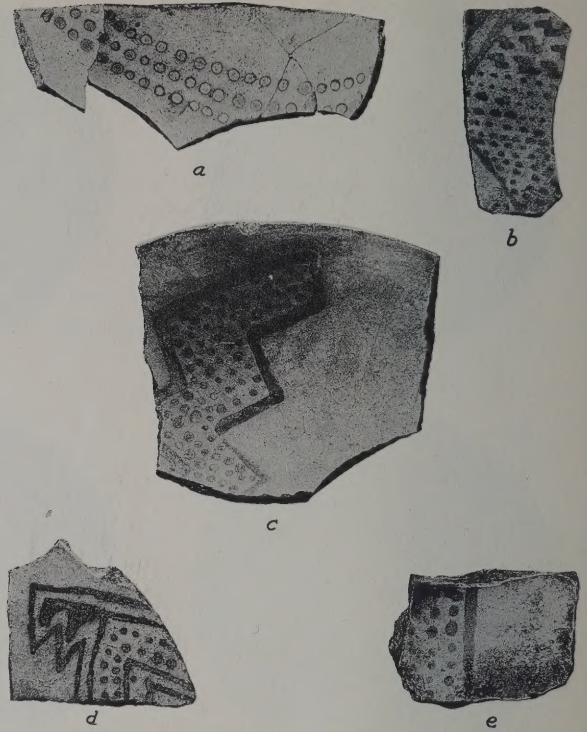


FIG. 107

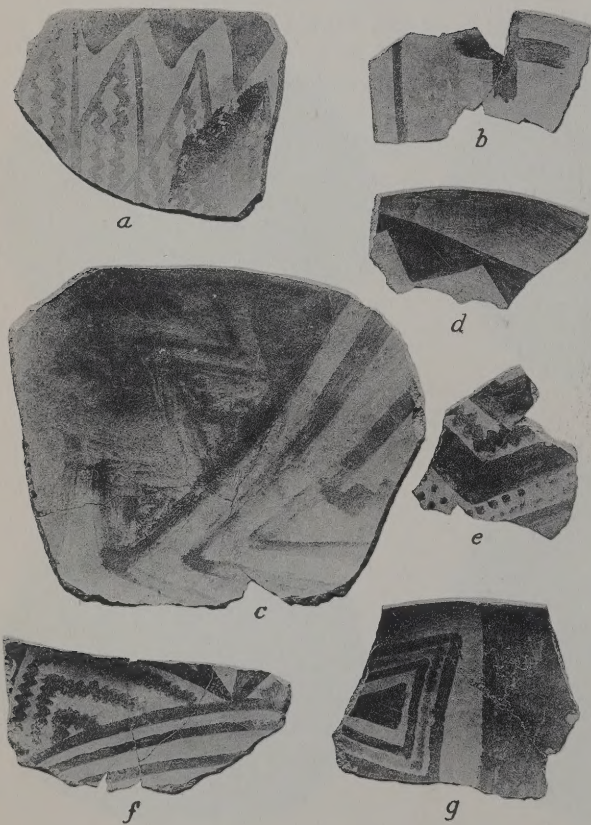


FIG. 108

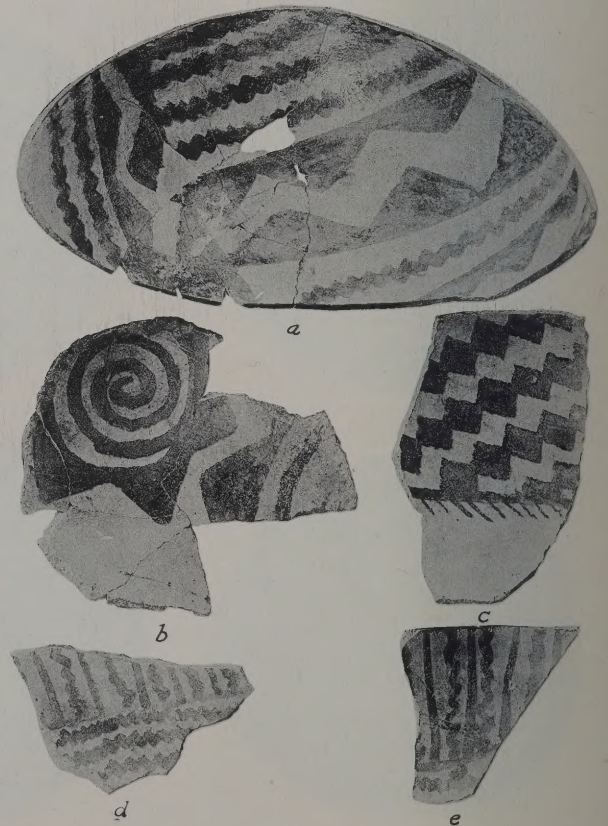


FIG. 109

FIGURES 106-109

POTSHERDS FROM PUEBLO I LEVELS, SITE 13. Figs. 106-107, Basket Maker III black-on-white. Figs. 108, 109, except 108, *d*, are Abajo Red-on-orange sherds, showing elements and design combinations not presented in the photographs and drawings of whole specimens. Fig. 108, *d* is a La Plata Black-on-red sherd, black paint on a red slip.

PROVENANCE

FIG. NO.	LOCATION IN SITE 13	FIG. NO.	LOCATION IN SITE 13
106, <i>a</i> *	Room 240A	108, <i>a</i> *	Room 99A
<i>b</i> *	" 242A	<i>b</i> *	Pit House G
<i>c</i> *	" 105	<i>c</i> *	" " N
<i>d</i> *	Pit House E	<i>d</i> *	surface
<i>e</i> *	pit N. of Room 110	<i>e</i>	Pit House B
<i>f</i> *	Room 242A	<i>f</i>	" " G
Max. width <i>a</i> : 4.8 cm.		<i>g</i> *	" " C
107, <i>a</i> *	Pit House E	Max. width <i>a</i> : 12 cm.	
<i>b</i>	" " B	109, <i>a</i> *	Room 4
<i>c</i> *	" " H	<i>b</i>	" 247
<i>d</i> *	" " I	<i>c</i> *	" 118
<i>e</i>	" " N	<i>d, e</i> *	Pit House G
Max. width <i>a</i> : 11.4 cm.		Max. width <i>a</i> : 22 cm.	

* Denotes rim sherd.

NOTES

The "basket-stitch" element appears in 106, *a, e*; 107, *b*. The wavy lines in 106, *b-d* seem to foreshadow their extensive use on Abajo pottery (compare with figs. 108, 109). The paint filling the dots in 107, *a* seems to be different from that of the outlines. 107, *d* is the same sherd as 103, *a*. The 2 holes in 106, *e*, probably for binding to stop the spreading of cracks, indicates that this standard Pueblo preventative system extended back well toward pottery beginnings. The way in which it worked can be seen better in fig. 111, *s*.

Figs. 108, 109 are all rim sherds except 108, *e, f* and 109, *b, d*. The narrow wavy lines shown here were relatively rare on Abajo Red-on-orange, those on fig. 104, *a* being the usual size. The wavy line used as a filler in 108, *g* was the smallest found. 109, *b* and *c* were rare but not unique designs at Site 13.

Black-on-orange and black-on-red sherds of types described by Morris and Shepard in Morris, 1939, in collections from the La Plata region of S.W. Colorado, were encountered occasionally at Site 13. The design elements were the same as many of those on the Abajo Red-on-orange, but the paint was a black, similar to that on some of the Abajo Polychromes (fig. 101). The black-on-orange was unslipped; the black-on-red had a thin slip. Marks left in the application of the red slip may be seen in 108, *d*.

FIGURE 110

MISCELLANEOUS POTTERY FROM PUEBLO I LEVELS AT SITE 13. *a-c* and *g* are unpainted bowls. *d-f* and *h-k* are sherds from banded-neck vessels. *l* is a unique specimen on Lino paste with a black exterior marked by roughly horizontal striations. *m* is unpainted, with small nodules. *n-p* are additional Abajo Red-on-orange designs. The top band in *o* carries through Classic Mesa Verde Pueblo III on Alkali Ridge. *q* is part of a large basin made of a paste with vegetable temper (grog). *r* is a vitrified sherd found with charred corn in a burned granary. The intense heat generated by burning corn often produced complete vitrification. This specimen was an Abajo Polychrome globular jar, without neck. The mouth and a horizontally pierced lug can be seen. Fig. 101, *d* is from the same jar; in fact, the 2 pieces fit together. Max. width of *o*: 16 cm.

PROVENANCE

FIG. NO.	LOCATION IN SITE 13	WARE	FIG. NO.	LOCATION IN SITE 13	WARE
110, <i>a</i>	Room 223	Lino Gray	110, <i>j</i> *	Room 83	Kana-a Gray
<i>b</i>	" 221	" "	<i>k</i> *	" 75	" "
<i>c</i>	" 99	" "	<i>l</i> *	Pit House H, fill	Lino paste
<i>d</i> *	" 16	Kana-a Gray	<i>m</i>	Room 99A	Lino Gray
<i>e</i> *	Pit House F, floor	" "	<i>n</i> *	Pit House E, floor	Abajo Red-on-orange
<i>f</i> *	Room 220A	" "	<i>o</i> *	Room 99A	" " " "
<i>g</i> *	Pit House C, S. end, floor	plain Abajo Orange	<i>p</i> *	" 15	" " " "
<i>h</i> *	Room 240A	Kana-a Gray	<i>q</i> *	" 218	vegetable temper
<i>i</i> *	Pit House C, S. antechamber	" "	<i>r</i> *	" 215	Abajo Polychrome

* Denotes rim sherd.





FIGURE 111

POTTERY VESSELS FROM PUEBLO II HORIZONS ON ALKALI RIDGE, all Mancos Black-on-white except *k*, which has a plain white slip, and *w*, a black-on-red. Max. width *o*: 18.5 cm.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
111, <i>a</i>	5	refuse mound, Pot 4, Burial 9	111, <i>l</i>	11	kiva, S. recess, fill
<i>b</i>	5	" " , " 4, " 8	<i>m</i>	8	refuse mound, Pot 1, Burial 2
<i>c</i>	8	" " , " 3, " 1	<i>n</i>	5	" " , " 1, " 10
<i>d</i>	13	Unit 1, Room U ₃	<i>o</i>	5	" " , with Burial 1
<i>e</i>	13	Room 208, fill under Room U ₁ , Unit 1	<i>p</i>	5	" " , " " 2
<i>f</i>	5	refuse mound, Pot 1, Burial 11	<i>q</i>	8	" " , Pot 4, Burial 1
<i>g</i>	5	" " , " 8, " 8	<i>r</i>	12	" " , " 1, " 1
<i>h</i>	5	" " , " 1, " 9	<i>s</i>	3	" " , with Burial 1
<i>i</i>	13	Unit 1, S. of Room U ₁	<i>t</i>	12	" "
<i>j</i>	8	refuse mound	<i>u</i>	12	Room D
<i>k</i>	5	" " , Pot 5, Burial 9	<i>v</i>	12	refuse mound
			<i>w</i>	11	kiva, S. recess, floor

NOTES

a-c are so called "seed bowls." *g* is approaching close to Mesa Verde design style; note lugs with black caps. *k* is a unique specimen with no painted decoration and crudely made; the neck has been broken off and the fracture smoothed. *m* has a "key-hole" perforation in the handle. The bowls, *q-w*, were selected to show the range of variation in shape and in wall angle. Compare with standard Pueblo I bowls, fig. 99, *u, v, x, y*. Pueblo II bowls are relatively deeper and steeper sided than most Pueblo I bowls. *u* is believed to represent a type restricted to early Pueblo II; it has thicker walls, inferior paste, inferior finish, and less attention paid to exterior than in ordinary Pueblo II bowls and also has a slight incurve at the rim. Although this was the only restorable specimen of the type found, sherds from similar bowls were found at Sites 7, 11, and 12, particularly in the post-and-adobe houses. *r* and *w*, of somewhat the same shape, have a superior finish. Note down-raking, horizontal strap-handles on *s*. These are characteristic of the large basin, and, again, are more common in early Pueblo II on Alkali Ridge than in late Pueblo II or Pueblo III. The design on the interior of *s* is shown in fig. 113, *b*. The holes on either side of the crack in *s* illustrate the "first-aid" given pottery throughout Pueblo prehistory. When a crack developed these holes were bored and connected by tightly bound bark fiber or sinew. The spreading of the crack was thus retarded and the vessel was prevented from falling apart. Although they can not all be seen in the illustration, fig. 113, *c* had 7 pairs of such holes.

FIGURE 112

LARGE BLACK-ON-WHITE JARS FROM PUEBLO II LEVELS ON ALKALI RIDGE. These are the so-called "water jars." They can all be classified as Mancos Black-on-white save *e*, which is a northeastern Arizona type, characteristic of the Kayenta, Black Mesa, Tusayan countries. Max. width, *e*: 36.8 cm.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
112, <i>a</i>	11	house area, E. trench	112, <i>d</i>	12	refuse mound
<i>b</i>	9	Room B	<i>e</i>	11	post houses, W. end
<i>c</i>	11	post houses, W. end	<i>f</i>	7	Room B

NOTES

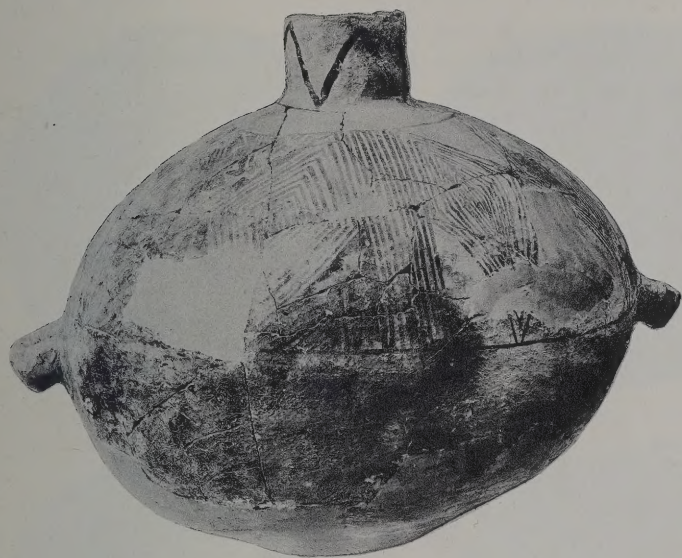
The necks of *a*, *b* have been broken off and the fractures trimmed. Note the handles: *a*, down-raking and indented; *b*, horizontal; *c*, *d*, down-raking; *e*, absent; *f*, slightly turned up, with an upward projecting lip. The bases are all indented, even *e*, which has a relatively very small base. *c* is quite asymmetrical; the base is well off-center, and the painted design is extremely irregular (see fig. 68, *b*).



a



b



c



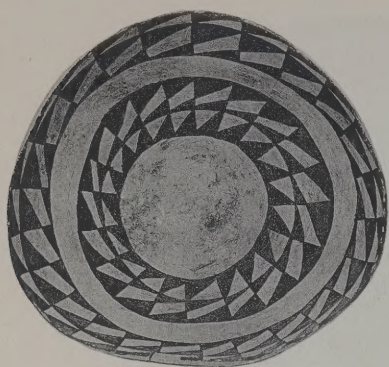
d



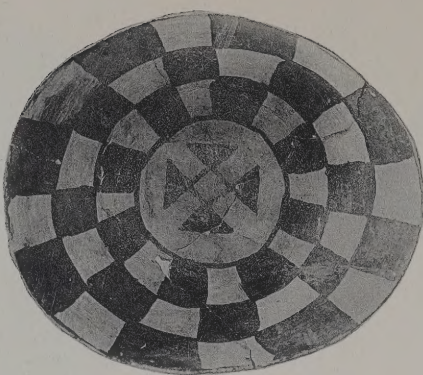
e



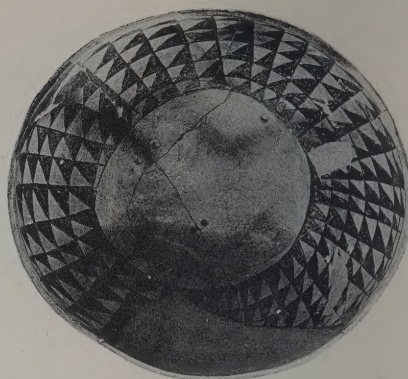
f



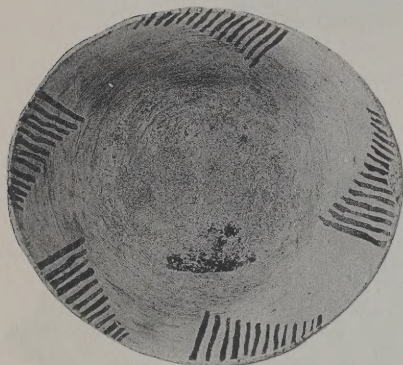
a



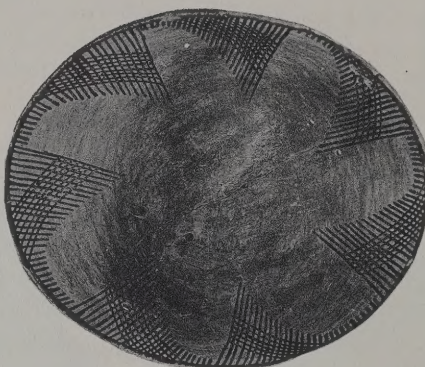
b



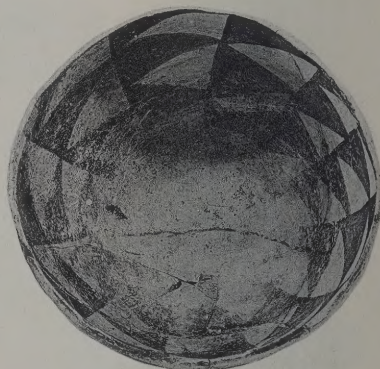
c



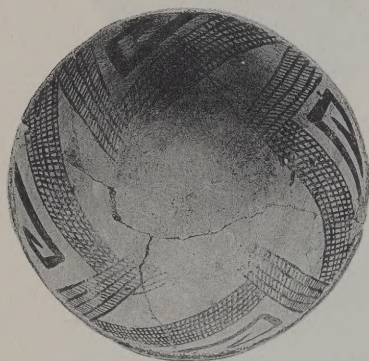
d



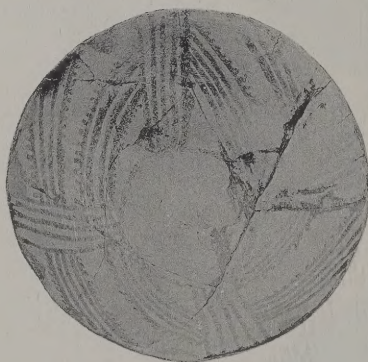
e



f



g



h



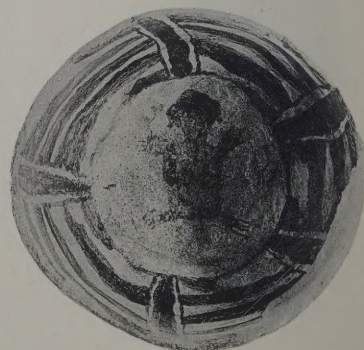
i



j



k



l

FIGURE 113

INTERIORS OF MANCOS BLACK-ON-WHITE BOWLS FROM PUEBLO II LEVELS ON ALKALI RIDGE. Max. diam. of *b* is 30 cm.; the others range from 17 to 24 cm.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
113, <i>a</i>	5	refuse mound, Pot 1, Burial 8	113, <i>g</i>	3	refuse mound, Pot 1, Burial 3
<i>b</i>	3	" " , Burial 1	<i>h</i>	5	" " , " 2, " 10
<i>c</i>	7	kiva fill	<i>i</i>	5	" " , " 3, " 12
<i>d</i>	5	refuse mound, Pot 2, Burial 12	<i>j</i>	5	" " , Burial 6
<i>e</i>	5	" " , Burial 4	<i>k</i>	8	" " , Pot 4, Burial 1
<i>f</i>	12	" " , Pot 1, Burial 1	<i>l</i>	5	" " , " 3, " 8

NOTES

All save one of these are from burials. The absence of the common hachured designs is noticeable in Alkali Ridge burials, although hachure is prominent in the refuse mound sherds. Apparently it was considered run-of-the-mill and not suitable as a burial offering.

The designs on *a* and *c* are among the few of Pueblo II which continue unchanged through Mesa Verde Pueblo III. The large checkerboard, *b*, on the other hand, is one of the few Pueblo II vessels which closely resemble in design the preceding Pueblo I Abajo Red-on-orange (see fig. 105, *j*). *b* had 2 strap-handles (see fig. 111, *s*). *c* is a very common design during Pueblo II in southeastern Utah and southwestern Colorado. Note repair holes; there were 7 pairs on this bowl. Oval shapes, like *e*, occur sufficiently often to suggest that they may have been intentional. The paint on many of these bowls, as on much southwestern so-called "black-on-white" is actually brown, usually dark, as in *j*, *k*, and *l*, but sometimes quite light, as in *h* and *i*. There are indications of a figure, probably zoöomorphic in the circle at the bottom in *k* but it could not be made out. For a drawing of the animal in *l*, see fig. 76, p. 276.

FIGURE 114

POTTERY FROM PUEBLO II LEVELS ON ALKALI RIDGE, except *k*, *k'*, and *l*, which are from Pueblo III. *f* is a Tusayan Polychrome, a northeastern Arizona type. *k*, *k'*, and *l* are Mesa Verde Black-on-white. The rest may be lumped as Mancos Black-on-white. All of the last named, save *a* and *b*, are ladles, or bowls of size similar to ladle-bowls. As in many southwestern pottery industries the ladles are cruder than other vessels, much less care having been taken with both construction and decoration. The difference is not so great on Alkali Ridge as in many regions (notably Pueblo IV in the Hopi country), but the ladles are less well made and consequently harder to handle taxonomically. *k* and *k'* are the reverse and obverse of a Mesa Verde "kiva-jar" lid. Max. diams. of *a*, *b*, *f* are 20.5, 22.5, 19 cm. The rest range from *j*, 8.5 to *d*, 13 cm. *k* is 9.5 cm.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
114, <i>a</i>	12	Room C	114, <i>g</i>	3	refuse mound, Burial 3
<i>b</i>	12	refuse mound, Pot 4, Burial 1	<i>h</i>	5	" " , Pot 8, Burial 9
<i>c</i>	3	" " , Burial 2	<i>i</i>	5	" " , " 6, " 9
<i>d</i>	3	" " , " 4	<i>j</i>	5	" " , " 5, " 8
<i>e</i>	12	" " , Pot 7, Burial 9	<i>k, k'</i>	6	kiva fill, below bench level
<i>f</i>	5		<i>l</i>	1	large refuse mound

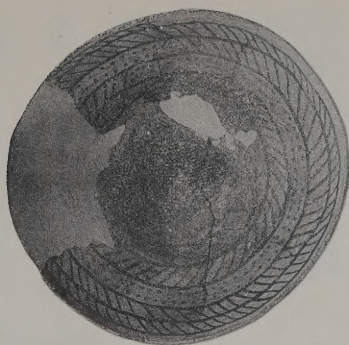
NOTES

The design on *a* is unusual for Pueblo II, resembles Basket Maker III. Although the plaster patch masks it, the design in *b* is a spiral (see fig. 73, p. 276). The Tusayan Polychrome bowl, *f*, has a steep, high wall and the design was consequently difficult to reproduce 2-dimensionally but an indication may be obtained from the sketch in fig. 76, *b*, p. 276. The ladle, *j*, has a "trough" handle, generally accepted as a vestige of the "half-gourd" ladles of Basket Maker II. The Mesa Verde "kiva jar" is a globular vessel without neck and with a flange encircling the opening. The lid, *k, k'*, sits on the flange (see fig. 191, *j*). Although it doesn't show well here, in the center of *k'* there is a vertical loop-handle. *l* comes from Site 1 but not from the excavated units. It was found protruding from the refuse mound of one of the large Classic Mesa Verde units.

Drawings of most of these designs will be found in figs. 69-76.



a



b



c



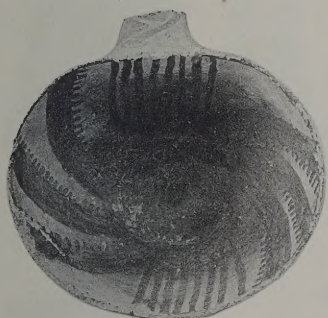
d



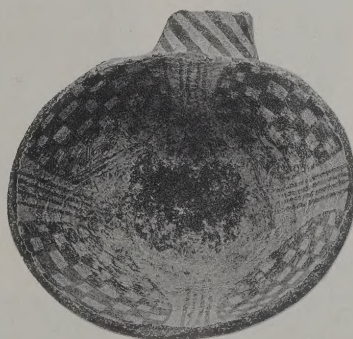
e



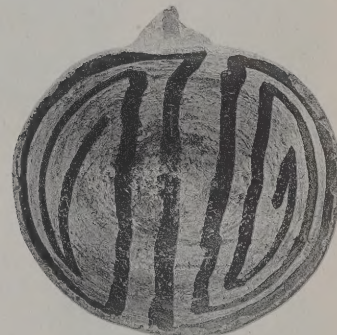
f



g



h



i



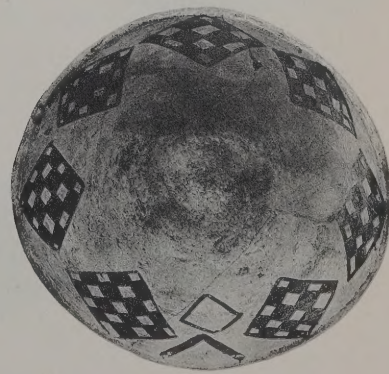
j



k



k'



l

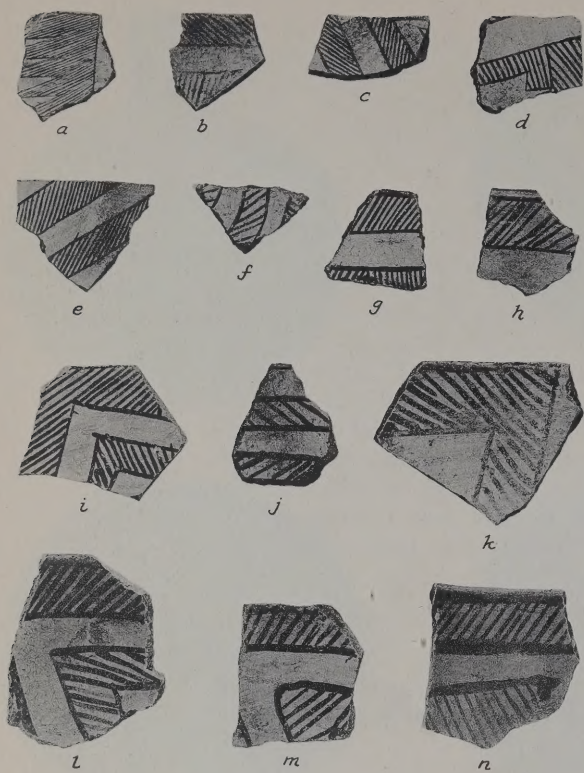


FIG. 115

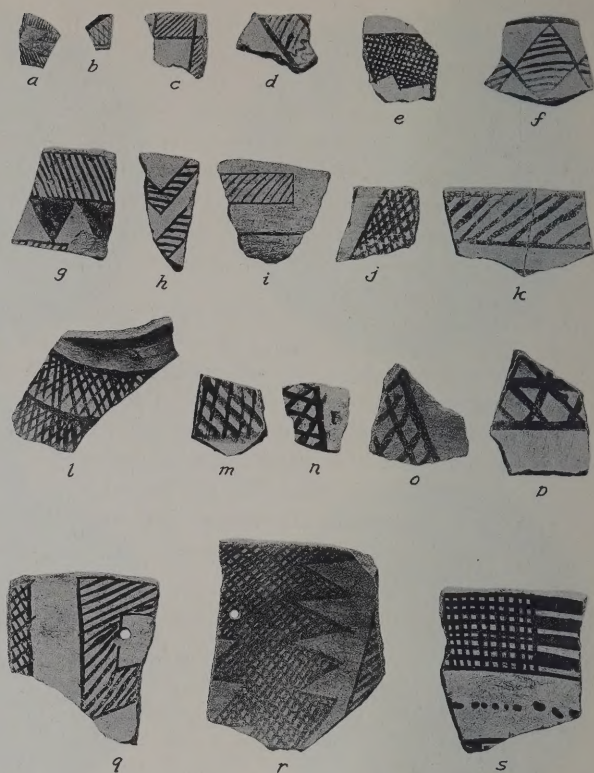


FIG. 116

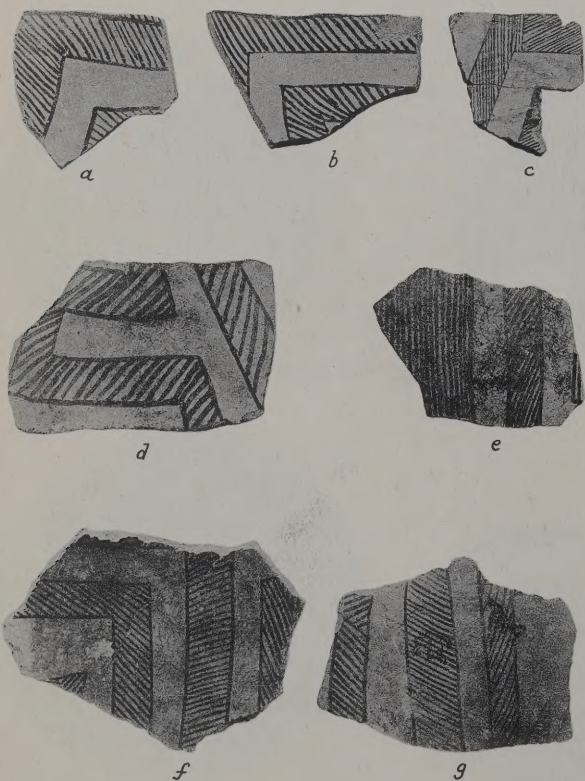


FIG. 117



FIG. 118

FIGURES 115-118

POTSHERDS FROM PUEBLO II LEVELS ON ALKALI RIDGE, SHOWING HATCHING (HACHURE) AND CROSS-HATCHING. Current usage of the terms "hatching" and "hachure" by Southwestern archaeologists is incorrect according to Webster's Dictionary. The Denver Clearing House claims "hatching" is correctly used in this connection. I can find no authority for this position. Both terms define lines used in drawing for shading. Consequently, as we have used them for years, they constitute a special Southwestern idiom, and one is as good or as bad as the other. Fig. 115 shows size range in both framing and filler lines in plain hatching. Fig. 116 shows the variation encountered in 1 small site, Site 3. Figs. 117, 118 indicate the use of hatched elements in designs. Hatching is one of the most important basic elements in Mancos Black-on-white.

PROVENANCE

The sherds in fig. 116 all come from the refuse mound at Site 3. *f, g, j, k, q-s* are rim sherds. Max. width, 116, *a*: 1.8 cm.

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
115, <i>a</i> *	9	refuse mound	117, <i>e</i>	9	kiva fill
<i>b</i> *	12	" "	<i>f</i>	11	post houses, W. end
<i>c-e</i>	12	" "	<i>g</i>	8	refuse mound
<i>f</i>	11	" "	Max. width, <i>a</i> : 7.2 cm.		
<i>g</i> *	11	house area, N. central	118, <i>a</i> *	7	kiva fill
<i>h</i> *	11	" " , N.E.	<i>b</i>	11	post houses, W. end
<i>i</i> *	5	refuse mound	<i>c</i> *	11	house area, N. central
<i>j</i> *	7	Room A	<i>d</i> *	7	Room B, fill
<i>k*, l*</i>	8	refuse mound	<i>e</i> *	5	refuse mound
<i>m*, n*</i>	12	" "	<i>f</i>	7	Room A
117, <i>a*, b*</i>	7	kiva fill	<i>g</i>	7	kiva fill
<i>c</i> *	5	Kiva 1, fill, below bench level	<i>h</i>	5	refuse mound
<i>d</i>	7	kiva fill	Max. width, <i>a</i> : 8 cm.		

* Denotes rim sherd.

NOTES

Note change in direction of hatching in 115, *d* and 117, *c*; also difference in width of framing lines in 115, *i*. The hatching in 115, *a* measures 27 lines to the inch; in 115, *n* it is 6 lines to the inch.

FIG. 116. This plate of sherds, all from Site 3, illustrates many things, one of which is the difficulty of applying a typology based on the relative width of framing and filler lines to Alkali Ridge hatching. Site 3 is one of the smallest sites we dug, yet the differences in this single aspect, which have been used elsewhere as a chronological diagnostic, are well illustrated by *b, c*, and *d*, with relatively wide framing lines, and *a, g, h*, and *r*, with no appreciable difference between frame and filler; while in *f, k, m*, and *q* one can have it either way. (There are certain taxonomic disadvantages to collecting and examining all of the sherds at a site.) *d* has wavy hatching as well as straight. *i* is a unique hachure on Alkali Ridge, probably a Pueblo I type. *s* probably originated in a nearby Pueblo III site.

FIG. 118, *c* is a sherd from a long-necked pitcher with a slight flare at the lip. *d* shows the painted rim, a common feature on Mancos Black-on-white bowls, as on Abajo Red-on-orange before them.

FIGURES 119-122

POTSHERDS FROM PUEBLO II LEVELS ON ALKALI RIDGE, SHOWING FURTHER VARIATION IN THE USE OF HATCHING, all black-on-white save *f*, a black-on-red. Fig. 119 shows some of the hatching layouts. Fig. 120, hatching used in combination with other elements. Fig. 121, wavy-line hatching and odd pieces. Fig. 122, size range and variations in cross-hatching. Cross-hatching seems to be more prevalent in Mancos Black-on-white than in either Chaco or Kayenta Pueblo II types.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
119, <i>a</i> *, <i>b</i> *	12	refuse mound	121, <i>a</i> *, <i>b</i> *	11	refuse mound
<i>c</i>	11	house area, N.E.	<i>c</i> *	7	kiva fill
<i>d</i>	9	refuse mound	<i>d</i>	5	refuse mound
<i>e</i>	11	post houses, W. end	<i>e</i>	—	hilltop site E. of Camp 1
<i>f</i>	13	Unit 4, surface	<i>f</i> *	3	refuse mound
<i>g</i> *	11	kiva, upper fill	<i>g</i> *	7	kiva fill
Max. width, <i>a</i> : 11.8 cm.			<i>b</i> *	11	post houses, W. end
120, <i>a</i>	12	refuse mound	<i>i</i>	12	refuse mound
<i>b</i>	5	Kiva 1, fill, below bench	<i>j</i>	7	kiva fill
<i>c</i> *	12	refuse mound	Max. width, <i>a</i> : 4.8 cm.		
<i>d</i> *	9	Room C	122, <i>a</i> *	5	refuse mound
<i>e, f</i> *	5	refuse mound	<i>b</i> *	3	Room E
<i>g</i>	13	Unit 1, kiva fill, below bench	<i>c</i> *	7	kiva fill
<i>b</i> *	7	kiva, fill of horiz. ventilator shaft	<i>d</i>	12	refuse mound
<i>i</i>	11	house area, N.E.	<i>e, f</i> *	7	kiva fill
Max. width, <i>a</i> : 4.3 cm.			<i>g</i> *	8	refuse mound
			<i>b, i</i>	8	" "
			<i>j</i> *	5	Kiva 1, pit P, fill
			<i>k</i> *	5	refuse mound
			Max. width, <i>a</i> : 4 cm.		

* Denotes rim sherd.

NOTES

FIG. 119. *a* is a rim sherd of a bowl; *b* is a piece, complete as to height, of the neck of a large jar. *c, d* are body sherds from large jars. *f* is a re-used bowl sherd.

FIG. 120. *b* is part of a neck and shoulder, probably from a pitcher; photograph upside-down.

FIG. 121. Note combination of plain and cross-hatching in *a, b*, and *g*; plain and wavy hatching in *j*; and all 3 in *d*. Wavy hatching is generally considered as early Pueblo II. The Alkali Ridge finds tend to substantiate this, although very few pieces with wavy hatching were found (less than 1% of the sherds with hatching at any site). On the other hand, the wavy line was by far the most common element in Pueblo I Abajo Red-on-orange. *d, e, i*, and *j* are from large jars. *f* is a Tusayan Black-on-red, with an external red band.

FIG. 122. *a* suggests a Pueblo I fine line painting technique and may be a survival. *d, e* are from pitchers or small jars. *b, i* are from large jars. *k* is part of a ladle handle with a small portion of the bowl.

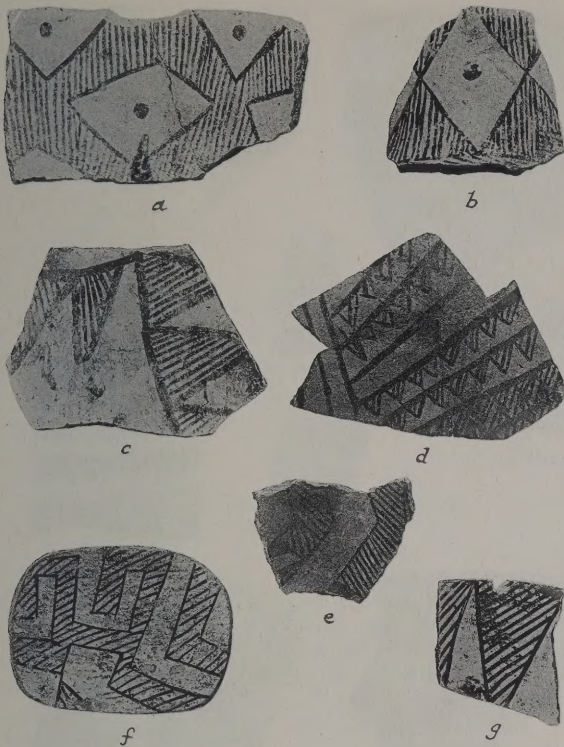


FIG. 119

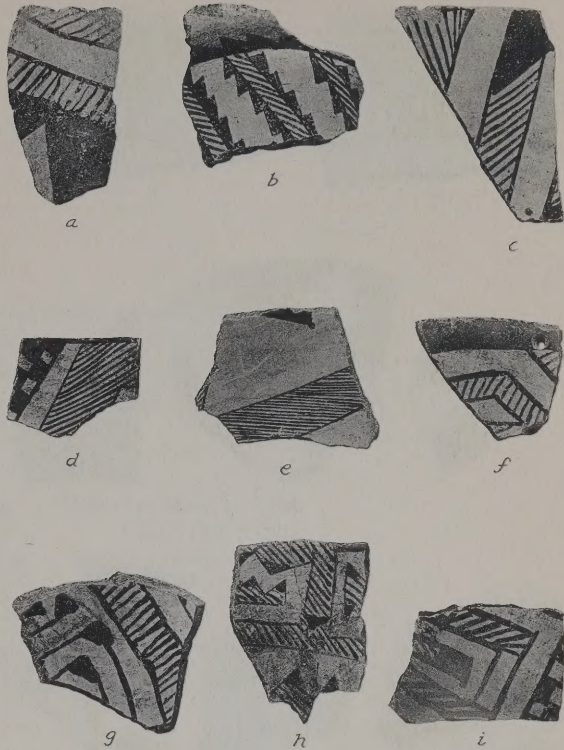


FIG. 120

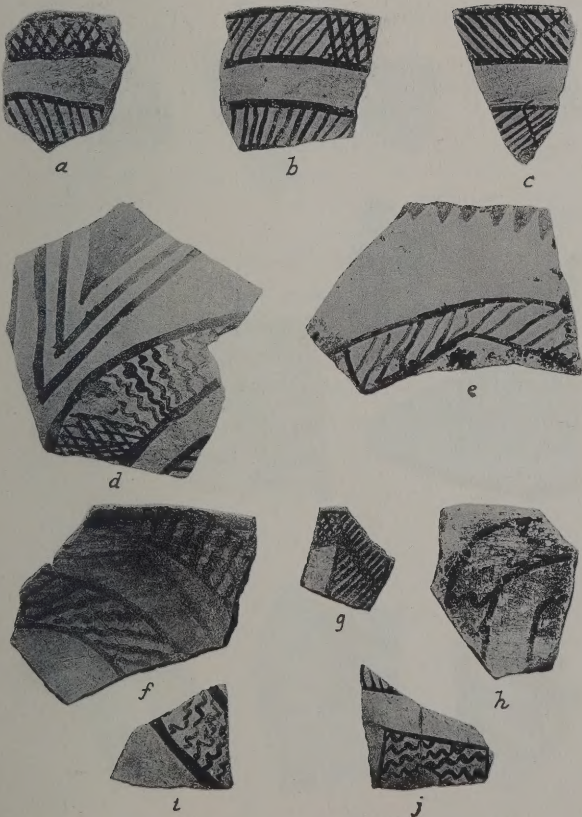


FIG. 121

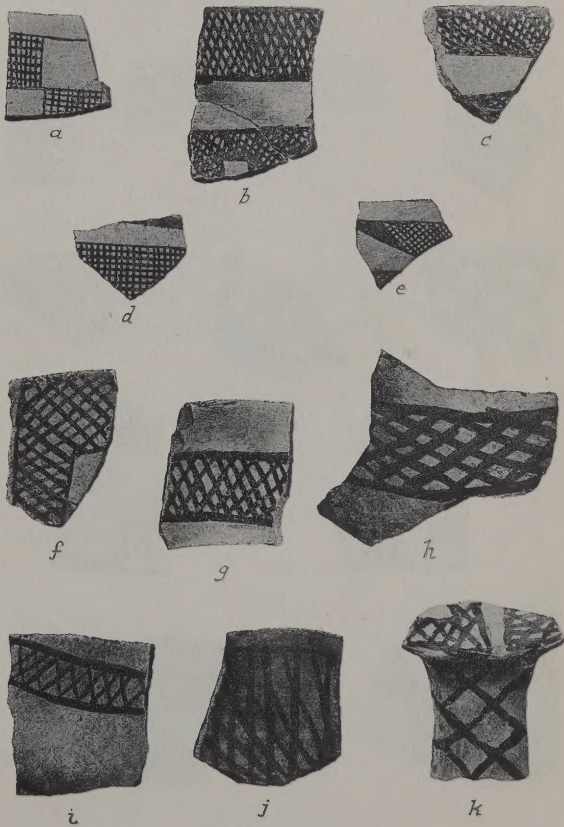


FIG. 122

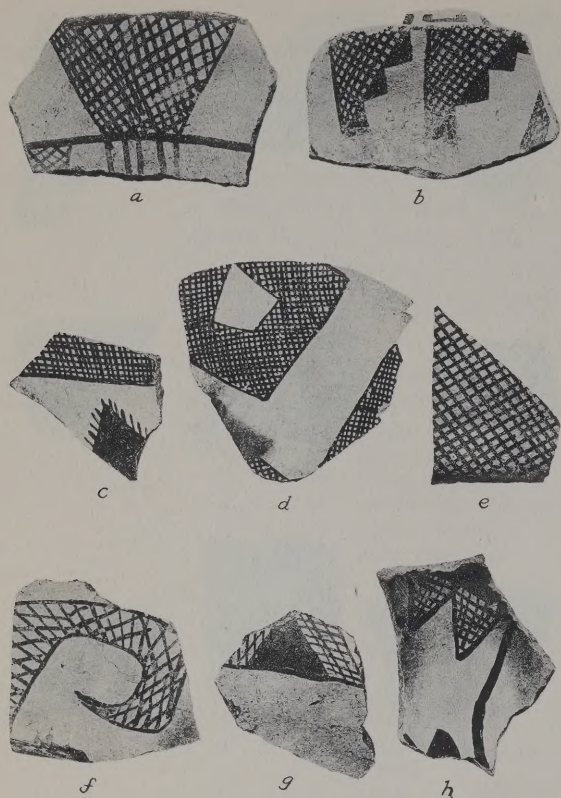


FIG. 123

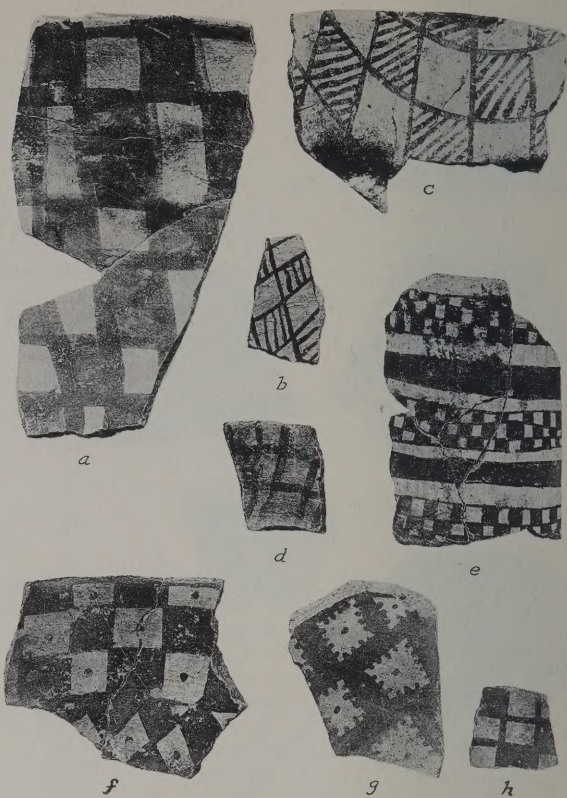


FIG. 124

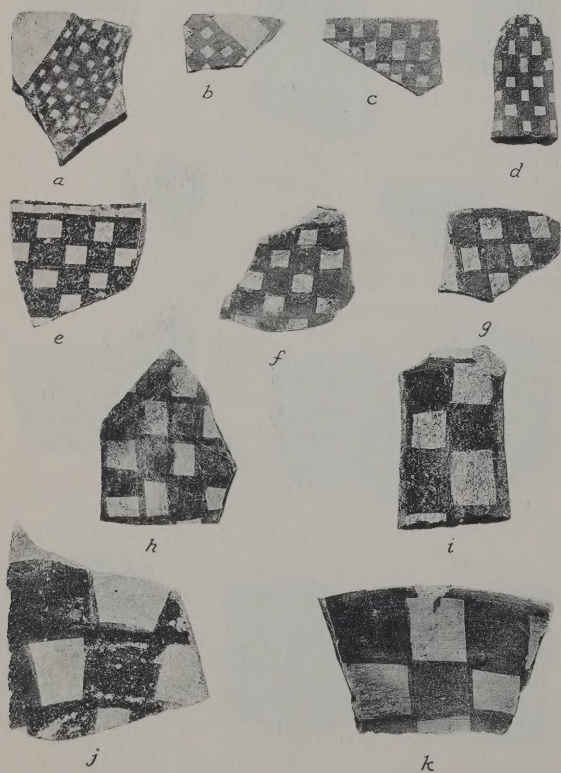


FIG. 125

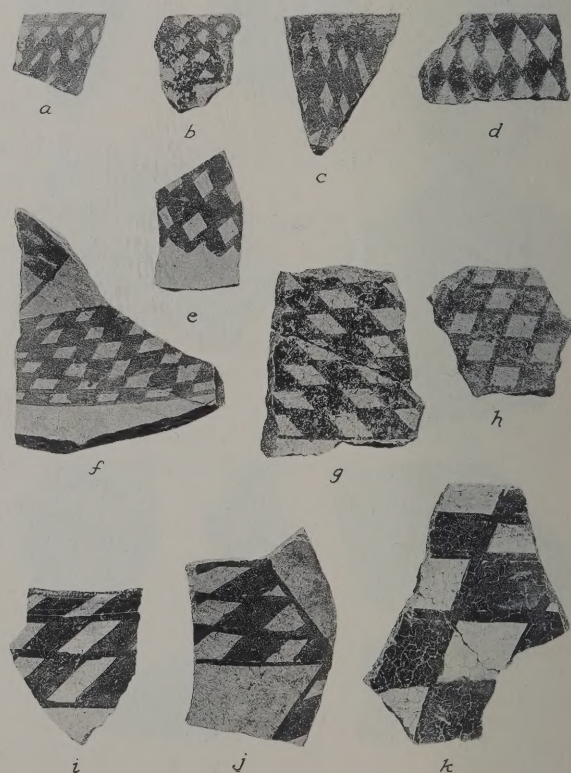


FIG. 126

FIGURES 123-126

POTSHERDS FROM PUEBLO II LEVELS ON ALKALI RIDGE. Fig. 123 shows some of the cross-hatching layouts. Figs. 124-126 present various forms of the checkerboard and diagonal checkerboard. The designs were not very common on the Pueblo I Abajo Red-on-orange but were used extensively on Mancos Black-on-white and continued to be popular during Mesa Verde Pueblo III.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE
123, <i>a</i> *	8	house area
<i>b</i> *	7	kiva fill
<i>c</i>	5	refuse mound
<i>d, e</i>	7	kiva fill
<i>f</i>	5	refuse mound
<i>g</i>	7	kiva fill
<i>h</i>	5	refuse mound
Max. width of <i>a</i> : 10.2 cm.		
124, <i>a</i> *	5	refuse mound
<i>b</i>	8	" "
<i>c</i> *	11	post houses, W. end
<i>d*, e</i> *	9	refuse mound
<i>f</i> *	8	" "
<i>g, h</i> *	12	" "
Max. width of <i>a</i> : 9.1 cm.		
125, <i>a</i>	8	refuse mound
<i>b</i>	11	" "
<i>c</i> *	9	" "
<i>d</i>	7	kiva fill

* Denotes rim sherd.

FIG. NO.	SITE	LOCATION IN SITE
125, <i>e</i>	5	Kiva 1, pit P, fill
<i>f, g</i>	11	post houses, W. end
<i>h</i>	7	refuse mound
<i>i</i>	3	Room C, fill
<i>j</i>	3	Room C, fill
<i>k</i> *	3	Room A, top fill
Max. width of <i>a</i> : 4.3 cm.		
126, <i>a</i> *	5	refuse mound
<i>b</i> *	5	" "
<i>c</i>	9	" "
<i>d</i> *	9	" "
<i>e</i>	11	house area, N.E.
<i>f</i>	8	refuse mound
<i>g, h</i>	9	" "
<i>i</i> *	9	" "
<i>j, k</i> *	9	" "
Max. width of <i>a</i> : 2.4 cm.		

NOTES

FIG. 123. *b* is part of a ladle. *d-g* are parts of large jars.

FIG. 124. *a-c* are among the few Pueblo II sherds found with close design resemblance to the Pueblo I Red-on-orange (compare fig. 105, *j, k*). *e* is part of a long-necked pitcher. The smooth edge at the top of *g* represents re-use.

FIG. 125. *d* and *i* are ladle handles.

FIG. 126. The diagonal checkerboard also goes back into Pueblo I. It was found on Abajo Red-on-orange at Site 13, though very rare.

FIGURES 127-130

BLACK-ON-WHITE POTSDHERDS FROM PUEBLO II LEVELS ON ALKALI RIDGE. Fig. 127, curvilinear designs, including scroll and interlocking scroll. Curves are not common in Mancos Black-on-white, but some were found at all sites. Fig. 128 illustrates a design whose importance in the Mancos ware has been underemphasized—and the same statement can be made for 129, negative rhomboids and diamonds, and for 130, triangles. Our knowledge of Mancos designs and of Pueblo II designs throughout the San Juan has suffered considerably through overemphasis of hachure.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
127, <i>a</i> *	3	refuse mound	128, <i>f</i> *	12	refuse mound
<i>b</i> *	8	" "	<i>g</i> *	3	" "
<i>c</i> *	5	" "	Max. width, <i>a</i> : 8.6 cm.		
<i>d</i> *	13	Unit 4, surface	129, <i>a</i> *	12	refuse mound
<i>e</i> *	8	refuse mound	<i>b</i> *	3	" "
<i>f</i>	2	" "	<i>c</i>	12	Kiva 2, fill, below bench
<i>g</i>	9	" "	<i>d</i>	12	refuse mound
<i>h</i>	2	" "	<i>e, f</i> *	3	" "
<i>i</i> *	5	" "	<i>g</i>	9	" "
<i>j</i> *	11	post houses, W. end	<i>h</i> *	12	" "
<i>k</i> *	11	refuse mound	<i>i*, j</i> *	8	" "
<i>l</i> *	13	Unit 1, kiva, below bench	<i>k</i>	5	" "
Max. width, <i>a</i> : 9 cm.			<i>l</i> *	9	" "
128, <i>a</i> *	11	house area, N. central	Max. width, <i>a</i> : 5.2 cm.		
<i>b*, c</i> *	7	kiva fill	130, <i>a*-o*</i>	12	refuse mound
<i>d</i> *	3	" " , near floor	<i>p</i> *	8	" "
<i>e</i> *	3	Room E	all rim sherds		
			Max. width, <i>a</i> : 6.8 cm.		

* Denotes rim sherd.

NOTES

FIG. 127. Curvilinear designs, rare on Alkali Ridge Mancos Black-on-white, occur much more frequently on ladles than on other forms. *a, b, c, e, f, h,* and *k* are from ladles or very small bowls. A few scrolls were used in the earlier Abajo designs (fig. 109, *b*). *d, g* are from jars. A negative Pueblo II scroll design is shown in fig. 137, *e*.

FIG. 128. This design is common in Pueblo II and continued to be popular in Mesa Verde Pueblo III (see fig. 76, p. 276). The method of building up design by outline and filler can be seen in *c*, a small-mouthed jar with raised shoulder.

FIG. 129. These designs may be described as negative rhomboids and negative diamonds or, from the other point of view, positive right-angle triangles and positive isosoles triangles, in reversed rows, apexes meeting. They occur fairly commonly on Mancos Pueblo II ware and become much more popular in Mesa Verde Pueblo III (see fig. 79, p. 286). *b* is from a large bowl with indented corrugated exterior. *c, d, e, f, g, j* are jar sherds; *j* and *k* are re-used.

FIG. 130. Triangles were used throughout the life of the Alkali Ridge potteries, more extensively in Pueblo II and Pueblo III than in Pueblo I. Rows of pendant and erect triangles, where the important design element is the triangle itself, were most popular in the Mancos Pueblo II. Mesa Verde Pueblo III used simple triangles, but by far the greatest use of triangles in Pueblo III times was in negative rhomboid, diamond, or zigzag (lightning) patterns formed between the rows of triangles. For the use of triangles in Mesa Verde design see figs. 74, 76-80.



FIG. 127

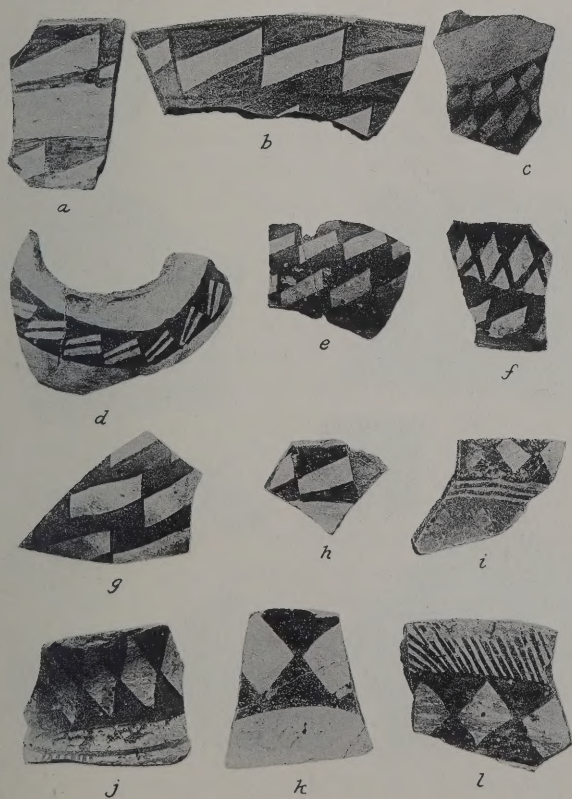


FIG. 129

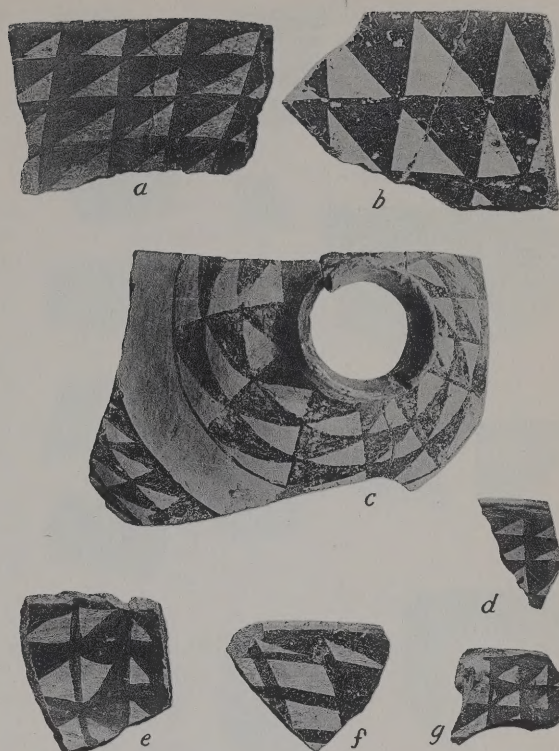


FIG. 128

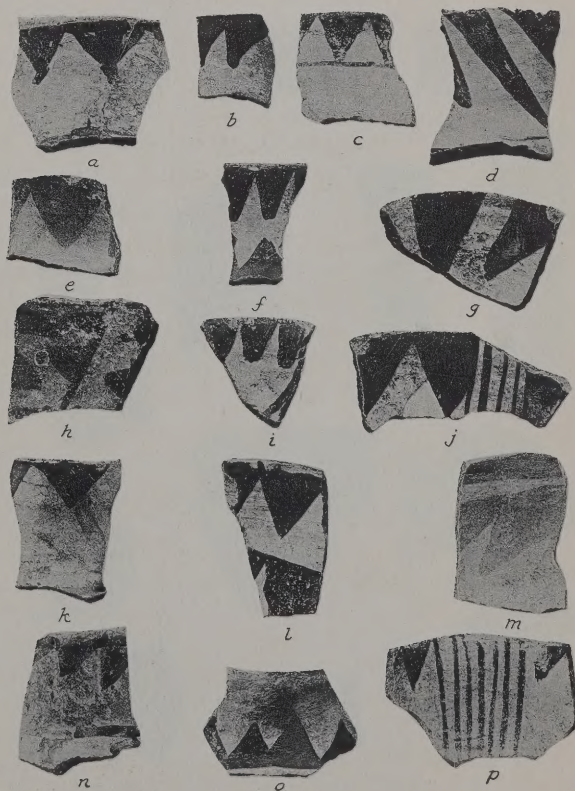


FIG. 130

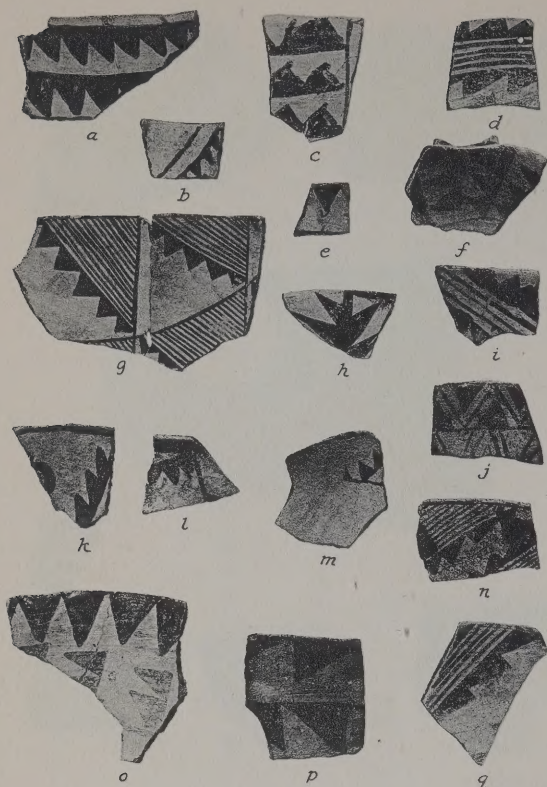


FIG. 131

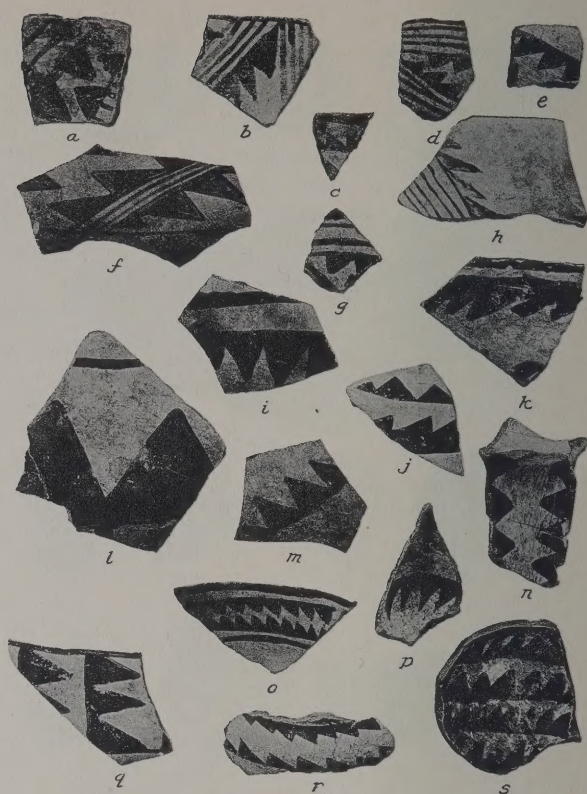


FIG. 132



FIG. 133



FIG. 134

FIGURES 131-134

BLACK-ON-WHITE POTSDHERDS FROM PUEBLO II LEVELS ON ALKALI RIDGE. Figs. 131-133 show the use of the triangle as a design element. Fig. 134 shows the half-terrace or key design. Stepped figures were common in Pueblo I Abajo designs, were used sparingly on the Pueblo II Mancos Black-on-white shown here, and then experienced a revival in Mesa Verde Pueblo III.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
131, <i>a</i> *	5	refuse mound	133, <i>a</i> *	3	refuse mound
<i>b</i> *	7	kiva fill	<i>b</i>	12	" "
<i>c</i> *, <i>d</i> *	5	refuse mound	<i>c</i> *	12	Kiva 1
<i>e</i> *	11	" "	<i>d</i>	5	refuse mound
<i>f</i> *	5	" "	<i>e, f</i>	12	" "
<i>g</i> *	11	post houses, W. end	<i>g</i>	2	" "
<i>h</i> *	7	refuse mound	<i>h</i> *	8	" "
<i>i</i> *	5	" "	<i>i</i> *	12	" "
<i>j</i> *	9	" "	<i>j</i> *	12	Kiva 2, floor
<i>k</i> *	5	" "	<i>k</i> *	12	Room L, fill
<i>l</i> *	11	house area, N.E.	<i>l</i> *	12	refuse mound
<i>m</i>	11	refuse mound	<i>m</i>	5	kiva, Pit P, fill
<i>n</i> *	9	" "	<i>n</i> *	12	refuse mound
<i>o</i> *	7	kiva fill	Max. width, <i>a</i> : 6 cm.		
<i>p</i> *	11	house area, N.E.	134, <i>a</i> *	9	refuse mound
<i>q</i> *	13	Unit 1, kiva, top fill	<i>b</i> *	12	" "
Max. width, <i>a</i> : 10.4 cm.			<i>c</i> *	9	" "
132, <i>a</i> *, <i>b</i> *	12	refuse mound	<i>d</i> *, <i>e</i>	7	kiva fill
<i>c</i> *	12	" "	<i>f</i> *	5	Kiva 1, Pit P, fill
<i>d-m</i>	12	" "	<i>g</i>	9	kiva, top fill
<i>n</i> *	5	house area	<i>h</i> *	7	S. of house
<i>o</i> *	12	refuse mound	<i>i</i>	3	refuse mound
<i>p, q</i>	12	" "	<i>j</i>	12	" "
<i>r</i>	5	Kiva 1, fill, below bench	<i>k</i> *	7	kiva fill
<i>s</i>	12	refuse mound	Max. width, <i>a</i> : 5.8 cm.		
Max. width, <i>a</i> : 5.4 cm.					

* Denotes rim sherds.

NOTES

FIG. 131. *c, f, o* are similar to Abajo Pueblo I designs (see fig. 62, p. 266). *g*, a variant, on a large scale, of the basic design of fig. 128, must have been effective as an all-over design. *j*, though from one of the earlier Pueblo II sites, closely resembles a later Mesa Verde design (fig. 78, *l*, p. 286). *m* is a Pueblo I survival, probably imported. *n*, bearing the negative zigzag, common design in Pueblo II and III on Alkali Ridge, has a corrugated exterior.

FIG. 132. *n* is part of a "trough" ladle handle, much closer than most Pueblo II specimens to the true "half-gourd" type of Basket Maker II. *r* is a good example of the negative zigzag, from the shoulder of a medium-sized vessel, probably a pitcher. Note that *n* and *r* are from Site 5, the rest from the earlier Site 12 refuse mound. And, although *n* is an archaic type, structurally, the designs on both of these pieces are closer to Mesa Verde Pueblo III in appearance than are the others.

FIG. 133. This shows triangles in so-called hour-glass and bow-tie designs and at the 4 corners of a square; also, triangles with hooks; all designs providing continuity from earlier horizons (see figs. 52, *t* and 62). For hour-glass and bow-tie in Pueblo III, see fig. 80, *j-m*. For examples of *a* on whole vessels in Pueblo II, see figs. 113, *b*; 114, *j*; on a Pueblo III piece, 114, *k*.

FIG. 134. Although Mancos Pueblo II pottery designs at first glance seem quite different in detail and in general effect from those of the earlier Abajo Pueblo I, a closer examination, as has already been shown, produces an appreciable number of similarities, none more impressive than this set. Compare with figs. 56, *a*, 59, 60, 63. The half-terrace is much less popular in Pueblo II and usually occurs on large jars, in fact large design units in solid paint comparable to standard designs of Abajo Pueblo I are seldom found except on "water jars" in Pueblo II. Fig. 69, *c*, p. 274, is a striking exception on a bowl, although an unusually large bowl. The half-terrace or key returns to popularity in Pueblo III, in general with a more formalized treatment (fig. 75, p. 276).

FIGURES 135-138

BLACK-ON-WHITE POTTERY FROM PUEBLO II LEVELS ON ALKALI RIDGE, showing the use of parallel straight lines, "triangular scroll," and lines and triangles with ticks and pendant dots, all common techniques on Mancos Black-on-white. Fig. 135, *b*, on the other hand, is a fine-line Pueblo I black-on-white (Roberts' "Pueblo I East Black-on-white"; taxonomically, Kiatuthlanna Black-on-white [Gladwin]; sometimes called Piedra Black-on-white [Mera], see footnote †, table 8); the only good example of this type found on Alkali Ridge where we had expected it would be the standard painted pottery of Pueblo I.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
135, <i>a</i> *	11	Room B, fill outside wall	137, <i>a</i> *	12	Room L, fill
<i>b</i> *, <i>c</i>	9	refuse mound	<i>b</i> *	7	kiva, near floor
<i>d</i> *	3	" "	<i>c</i>	3	refuse mound
<i>e</i>	9	" "	<i>d</i> *	12	Kiva 2, floor
<i>f</i> *	6	" "	<i>e</i> *	3	refuse mound
<i>g</i>	7	kiva fill	<i>f</i>	8	" "
<i>h</i> *	7	S. of house	<i>g</i> *	2	house area, W. of Room A
<i>i</i> *	5	Kiva 1, fill, below bench	<i>h</i> *, <i>i</i> *	12	Room L, fill
<i>j</i>	7	kiva fill	<i>j</i> *	13	Unit 1, refuse
<i>k</i> *	12	refuse mound	Max. width, <i>a</i> : 12.4 cm.		
<i>l</i> *	8	" "	138, <i>a</i> *, <i>b</i> *	12	refuse mound
<i>m</i>	7	Room B, fill	<i>c</i> *	12	" "
<i>n</i>	—	hilltop site E. of Camp 1	<i>d</i>	3	" "
Max. width, <i>a</i> : 6 cm.			<i>e</i>	12	" "
136, <i>a</i> *	12	refuse mound	<i>f</i>	5	Kiva 1, floor
<i>b</i> *	12	post houses	<i>g</i>	12	refuse mound
<i>c</i> *, <i>d</i>	9	refuse mound	<i>h</i>	3	" "
<i>e</i>	3	" "	<i>i</i>	12	" "
<i>f</i>	13	Unit 1, kiva, top fill	<i>j</i> *	8	" "
<i>g</i>	12	refuse mound	<i>k</i> *	12	Kiva 2, top fill
<i>h</i> *	12	Room B	<i>l</i> *	3	refuse mound
<i>i</i>	9	refuse mound	<i>m</i>	12	" "
<i>j</i>	12	Room B	<i>n</i> *	7	S. of house
<i>k</i>	12	Room D	<i>o</i>	9	refuse mound
Max. width, <i>a</i> : 5.2 cm.			<i>p</i> *	5	" "
			Max. width, <i>a</i> : 6.5 cm.		

* Denotes rim sherd.

NOTES

Fig. 135. *a-f*; for examples of this characteristic Mancos Black-on-white design on whole bowls see fig. 113. *l* is one of the many forms of parallel vertical dividing lines used extensively in Mancos Black-on-white to break up the horizontal band into panels (see figs. 113, 114). *n* is a re-used sherd.

Fig. 136. The parallel-line designs shown here are much more rare in Mancos Black-on-white than are those of fig. 135. *d*, *e*, *i-k* show the so-called "concentric squares" design which appears also in fig. 73, *f*; for Pueblo I example, see fig. 53, *d*. It occurs on a sherd from a Mesa Verde Pueblo III cup in fig. 168, *g*. *h* is a design usually associated with Classic Mesa Verde (see fig. 80, *o-r*, p. 286), and it was a surprise to find it in a Pueblo II setting. Yet it comes from the jacal house at Site 12 and is on a vessel which technologically fits.

Fig. 137. *a*, *d*, *b-j* represent the design peculiarly known in the Southwest as "triangular scroll." It is quite common in Mancos Black-on-white sites in southeastern Utah (see fig. 113, *j* for whole bowl), but some of the pieces bearing it are probably imports from northeastern Arizona (like the Tusayan Polychrome in figs. 76, *b*; 114, *f*) where it was very popular during Pueblo II times. *a*, for instance, is technologically aberrant to Alkali Ridge and bears some resemblance to Black Mesa Black-on-white of Arizona.

Fig. 138. Ticked lines run throughout the Alkali Ridge pottery industries. In the Abajo pottery of Pueblo I they are shown in figs. 62 and 102, *k*, *l*; other Pueblo II examples are given in figs. 70, *e*, and 73, *a*; and their use in the Mesa Verde may be seen in 77, *d*; 78, *g*; 80, *e*; and 167-169. The ticks vary in size and length and sometimes, as in *e*, *p*, they are more properly described by the term pendant dots, newly assigned by the Clearing House for Southwestern Museums. In the Mesa Verde the ticks tend to be heavier, more rectangular in form, and more likely to approximate a 90° relationship with the base-line, although these specifications are sometimes met by Pueblo II painters, as in *m* from Site 12. The ticked triangles, *h*, *i*, bear close resemblance to the very common similar Abajo Pueblo I design (fig. 52, p. 260). The ticked dots, *j*, were, fortunately, unique on Alkali Ridge.

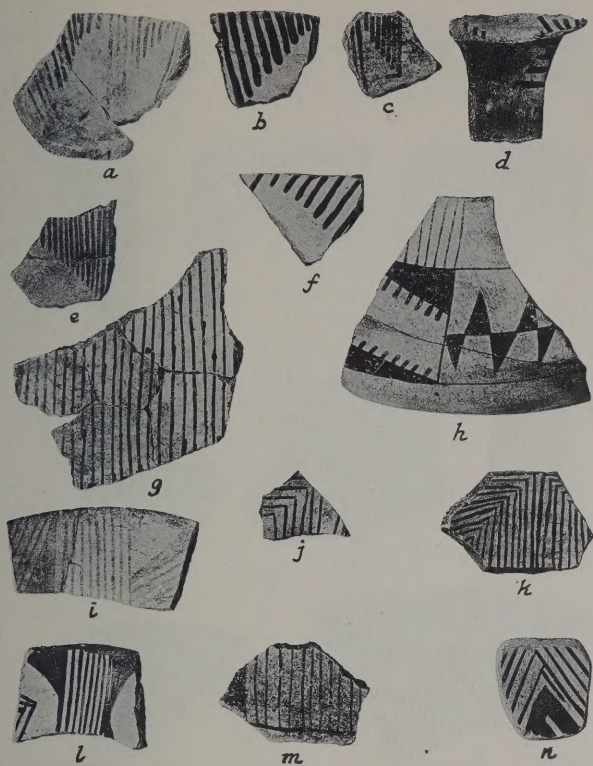


FIG. 135

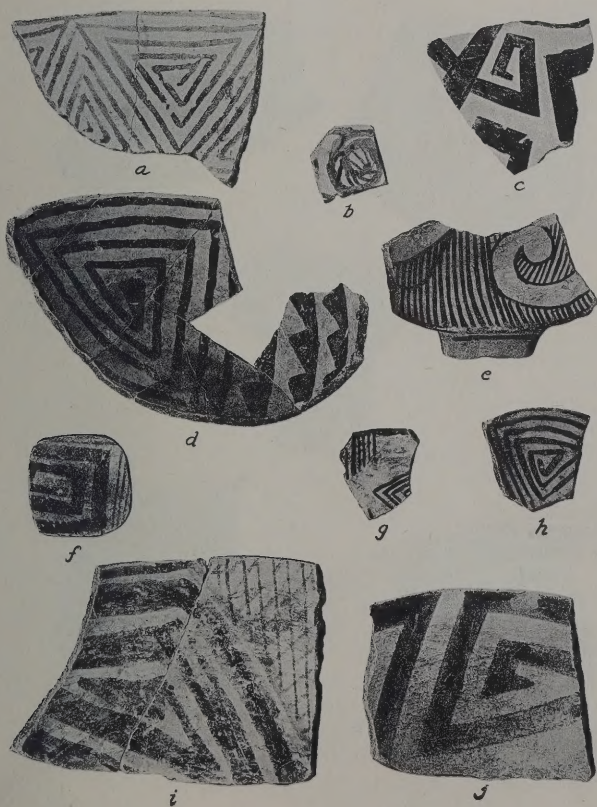


FIG. 137



FIG. 136



FIG. 138



FIG. 139



FIG. 141

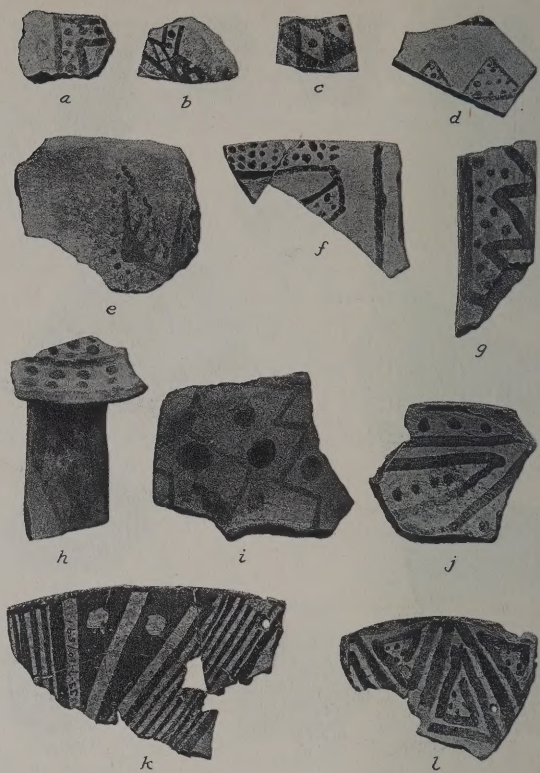


FIG. 140

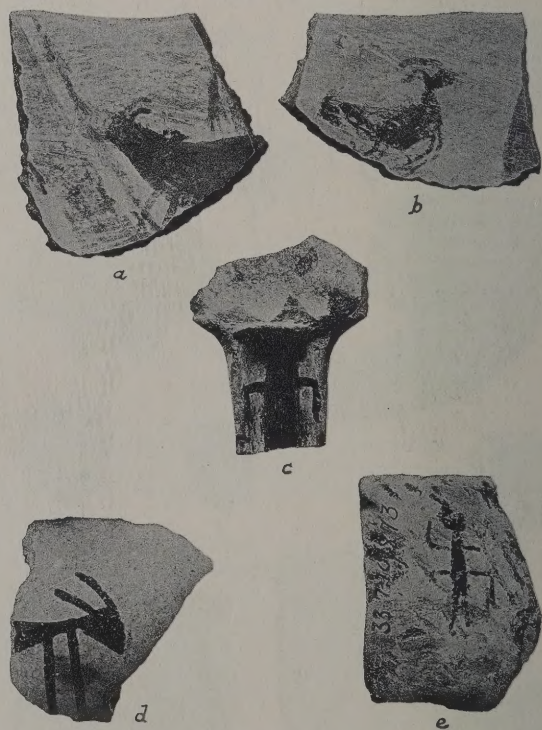


FIG. 142

FIGURES 139-142

BLACK-ON-WHITE POTSDHERDS FROM PUEBLO II LEVELS ON ALKALI RIDGE, except for 142, *d* which is a black-on-orange from Pueblo I. Figs. 139-140 show the use of dots by Mancos potters. Fig. 141 is a miscellaneous plate, including a unique polychrome, *d*. Fig. 142 shows the rare and undeveloped zoömorphics of Pueblo II, with a visitor from Pueblo I for comparison.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
139, <i>a, b</i> *	12	refuse mound	141, <i>a</i> *	13	Unit 1, Room U ₁ , fill
<i>c</i> *	11	" "	<i>b</i> *	13	Unit 1, kiva, top fill
<i>d, e</i> *	12	" "	<i>c</i> *	3	kiva floor
<i>f</i>	3	Room E	<i>d</i> *	12	refuse mound
<i>g-j</i>	12	refuse mound	<i>e</i> *	9	Room B, floor
<i>k</i>	11	" "	<i>f, g</i> *	7	kiva fill
<i>l, m</i> *	12	" "	<i>h</i>	12	refuse mound
<i>n</i>	12	" "	<i>i</i>	11	house area, N.E.
<i>o</i>	11	post houses, W. end	<i>j, k</i> *	3	refuse mound
Max. width, <i>a</i> : 3.2 cm.			<i>l</i> *	3	kiva, top fill
140, <i>a-c</i>	12	refuse mound	<i>m</i> *	9	refuse mound
<i>d</i>	3	" "	<i>n</i> *	12	" "
<i>e</i> *	12	" "	Max. width, <i>a</i> : 9 cm.		
<i>f</i> *	5	" "	142, <i>a</i> *	12	post houses, W. wing
<i>g</i>	8	" "	<i>b</i> *	12	S. of Kiva 1
<i>h</i> *	2	" "	<i>c</i> *	3	refuse mound
<i>i</i>	12	Room L, fill	<i>d</i>	13	Room 210A
<i>j</i> *	12	refuse mound	<i>e</i> *	8	refuse mound
<i>k</i> *	5	house area, N.E.	Max. width of <i>a</i> : 9 cm.		
<i>l</i> *	9	kiva fill, below bench			
Max. width, <i>a</i> : 4 cm.					

* Denotes rim sherds.

NOTES

FIG. 139. Dots were very common as design fillers on Basket Maker III black-on-whites (figs. 103, 107) and they were also used by themselves (fig. 107, *a*). Abajo Pueblo I pottery used dots very rarely: 58, *f* (105, *f*) and 102, *e*, and apparently only as fillers. In Pueblo II, as this plate shows, dots were used as fillers; by themselves, *n, o*; and to outline a design, *b*. Bull's-eye dots, *j*; outline dots, *k*; and large dots in clusters or as an all-over design, *n, o*—all these first occur on Alkali Ridge in Pueblo II and continue through Pueblo III, the large dots usually on large jars and ladles. Filler dots are used throughout, most prominent on Basket Maker III wares, rare in Pueblo I and Pueblo III, and not very common in Pueblo II, although a few examples were found at each site. *d, g, i* are ladle handles.

FIG. 140. *e* is an early Pueblo II "brown-on-white" from Site 12 with an indefinite Abajo feel about it. The triangle, with ticked hypotenuse, nested in a 90° angle, is a design found on our Pueblo I black-on-orange. *g, h* are from ladles. *k*, note the "negative dots"; this sherd is corrugated on the exterior.

FIG. 141. *a* and *b*, bird-track designs on jar necks, come from Unit 1, Site 13, a building on the border-line of Pueblo III, typologically. *d* is, as far as I know, unique—quite unlike the Pueblo II polychromes shown in fig. 101, *y-aa*. The base color is a light brownish gray, the lines are medium brown, and the areas marked X are coated with a slip of clay, in color slightly off white on the brown side, appreciably lighter than the ground color. For color chart readings, see p. 280. The design and rim of *e* are typical of northeastern Arizona, probably a trade piece (see fig. 112, *e*). *g* is part of a ladle, lip at the bottom; *i, j* are jar designs, *j* from a large globular jar without neck. *h* is the only Mancos Black-on-white sherd we found resembling the standard wavy line of the Pueblo I Abajo Red-on-orange (fig. 104, *a, b*). In this case, however, a straight line was drawn first, as a guide, and the wavy line superimposed. *l* is a good example of Mancos panels, with vertical parallel-line divisions. The paint is a very light brown on a white slip. *n*, a jar neck, is the finest example of the graduated parallel-line design shown in fig. 135, *a-f*.

FIG. 142. Zoömorphics designs were very rare on Alkali Ridge. *a, b, c*, and *e*, here, and figs. 76, *a* (113, *l*) and 147, *o*, a total of 6, are all we found in Pueblo II levels. *d* and one other quite similar are the total for Pueblo I. And there were none in the Mesa Verde, though the trait is known to occur on Mesa Verde pots (see Morris, 1939, fig. 59, 8). Like so many Pueblo II black-on-whites, the paint on *a* and *b* is a definite brown, on *h* a marked red-brown. The figure in *c* is in the trough of a ladle handle. *d* is a black-on-orange, from a Pueblo I level at Site 13. *e* is on the exterior of a bowl. Later, in Mesa Verde Pueblo III, most of the zoömorphics designs are on bowl exteriors.

FIGURES 143-146

POTSHERDS FROM ALKALI RIDGE SITES. FIG. 143, the so-called black-on-reds, which would be more properly described as decoration in black or red paint on red or orange backgrounds. *l* is red-on-white. All are from Pueblo II levels except *l* and *x*, Pueblo III. FIG. 144, black and red on orange polychrome (Tusayan Polychrome), all from Pueblo II levels except *g*, Pueblo III. FIG. 145, horizontal handles from large Mancos Black-on-white jars, Pueblo II. FIG. 146, ladle handles from Pueblo II Site 12.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
143, <i>a</i> *	12	refuse mound	144, <i>a</i> *	5	refuse mound
<i>b</i> *	11	kiva, top fill	<i>b</i>	11	" "
<i>c</i> *, <i>d</i> *	11	refuse mound	<i>c</i> *, <i>d</i> *	12	" "
<i>e</i> *	2	" "	<i>e</i> , <i>f</i> *	5	" "
<i>f</i> *	3	" "	<i>g</i>	6	" "
<i>g</i> *, <i>h</i> *	12	" "	<i>h</i>	12	" "
<i>i</i> *, <i>j</i> *	7	kiva fill	<i>i</i> *	5	Kiva 1, pit P, fill
<i>k</i>	11	kiva fill, below bench	<i>j</i> *	11	House A, fill
<i>l</i>	6b	refuse mound	<i>k</i>	12	refuse mound
<i>m</i>	11	post houses, W. end	<i>l</i> *	9	" "
<i>n</i> *, <i>o</i> *	12	refuse mound	Max. width, <i>a</i> : 5.8 cm.		
<i>p</i>	12	" "	145, <i>a</i>	7	kiva fill
<i>q</i> *	3	" "	<i>b</i>	12	refuse mound
<i>r</i>	12	" "	<i>c</i>	12	post houses, W. end
<i>s</i>	7	kiva fill	<i>d</i>	8	refuse mound
<i>t</i>	8	refuse mound	<i>e</i>	5	" "
<i>u</i>	11	N. of House A	<i>f</i>	7	kiva fill
<i>v</i>	5	refuse mound	<i>g</i>	5	refuse mound
<i>w</i>	12	" "	<i>h</i>	7	kiva fill
<i>x</i> *	6	" "	<i>i</i>	12	refuse mound
Max. width, <i>a</i> : 3.8 cm.			Max. width, <i>a</i> : 9 cm.		
* Denotes rim sherd.			146, <i>a-v</i>	12	refuse mound
			Max. width, <i>a</i> : 6.6 cm.		

NOTES

FIG. 143. Black-on-red sherds were in small minority but present in all Pueblo II and Pueblo III sites; most numerous, proportionally in those sites we have classified as early in Pueblo II; least numerous in Mesa Verde Pueblo III. The same is true for the polychromes (fig. 144). Most of these are probably from trade pieces. If that is true it indicates that with the extensive development of distinctive pottery in Mesa Verde Pueblo III the importation of foreign wares fell off. The theory that these are imported wares rather than local imitations of foreign types gains support from the unusual incidence of re-used sherds in the black-on-reds. Six of those shown, *b*, *p*, *s*, *t*, *u*, *x*, are re-used. The definite preference for red sherds for scraping tools, etc., shows, at least, a desire to preserve these rare pieces from the trash pile.

The large majority of the black-on-reds can be best classified as Tusayan Black-on-red. Ten of the 21 bowl sherds shown here, *c*, *f*, *h*, *j*, *m-p*, *s*, *u*, have red slip on all or part of the exterior. A few sherds like *i* and *j* seem sufficiently close in design to Abajo and La Plata red wares to suggest local derivation, but they, too, could have come from the south. The only listing in the taxonomic literature which approximates *l* is Three Circle Red-on-white (Haury) from the Mimbres country, but the correspondence is not exact.

FIG. 144. We found a few "Tusayan Polys" in our Pueblo II Sites 5, 9, 11 and 12. Nine of the 12 shown here have the characteristic red on the outside which did not, usually, cover the whole exterior, and often was applied in a crude, broad-line design.

FIG. 145. This shows horizontal handles on "water jars," single and double fillet; strap and tubular loops; rounded, flattened and indented.

FIG. 146. Ladle handles, showing variety from a single Pueblo II refuse mound. Top row, troughs: *a*, deep and wide, resembling the earlier "half-gourd" type; *e*, very shallow, trough wall less than 2 mm. high. 2nd row, flat straps; note variation in distal terminals. 3rd row, rounded, single, double, and triple fillets. 4th row, miscellaneous: *s*, rounded, others flat straps.

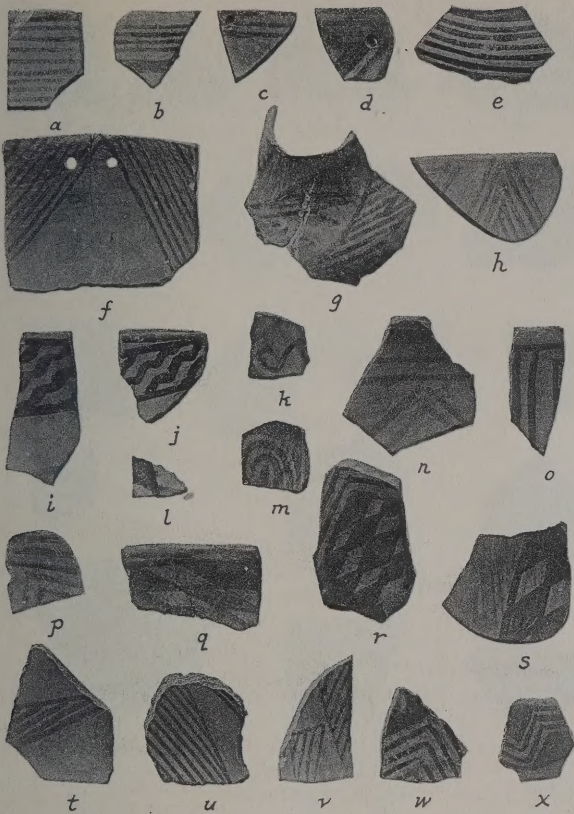


FIG. 143

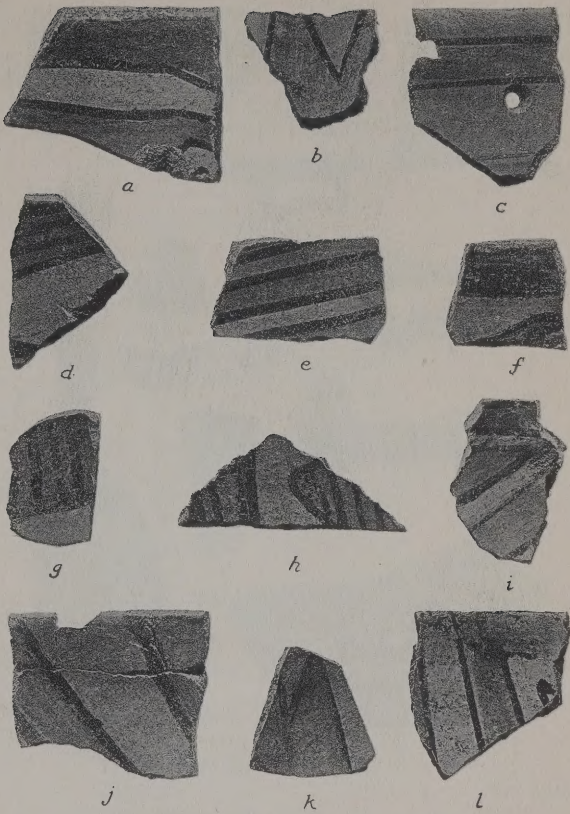


FIG. 144

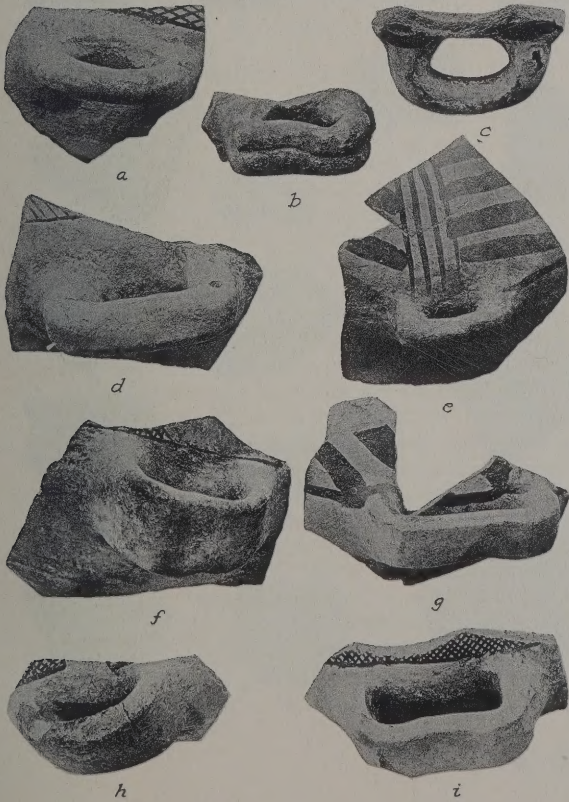


FIG. 145

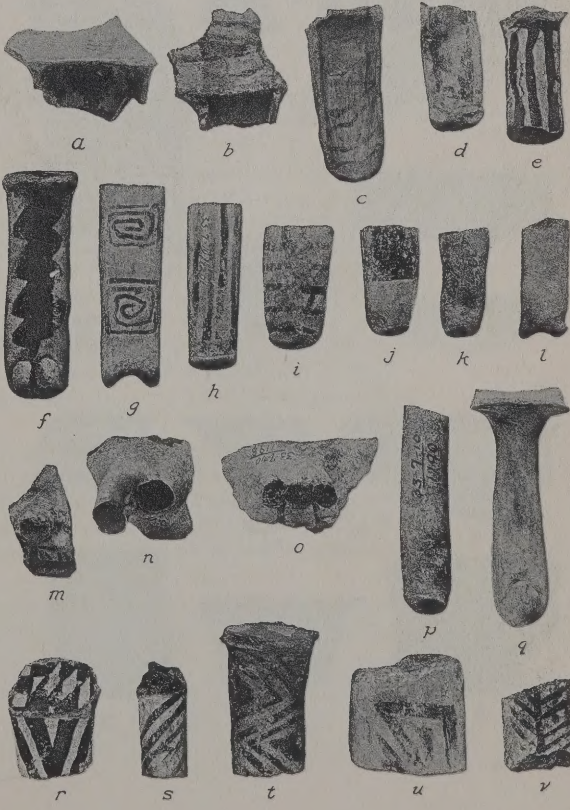


FIG. 146



FIG. 147

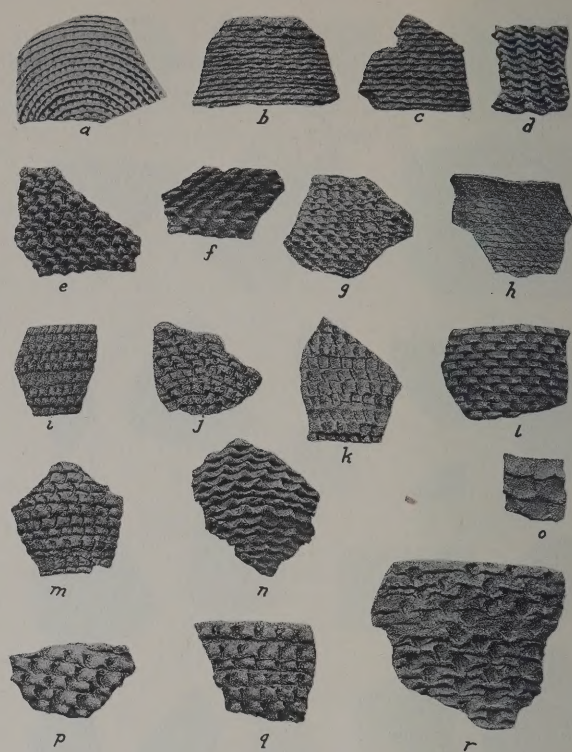


FIG. 148

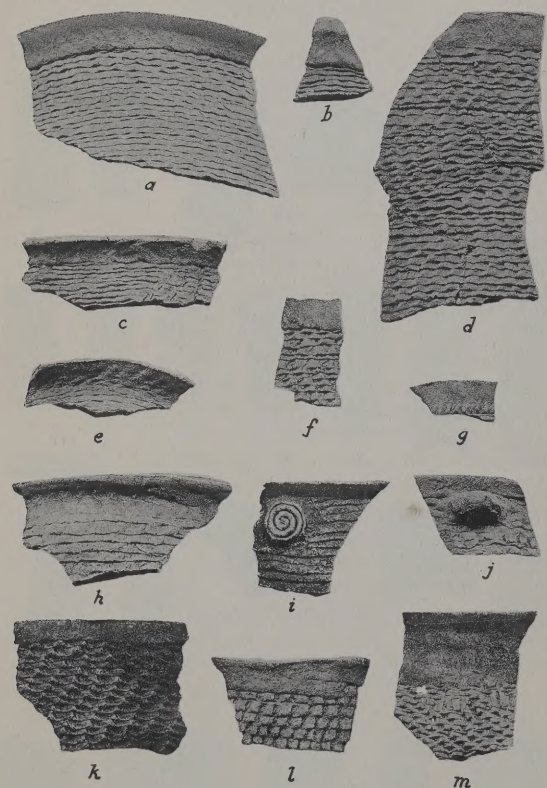


FIG. 149

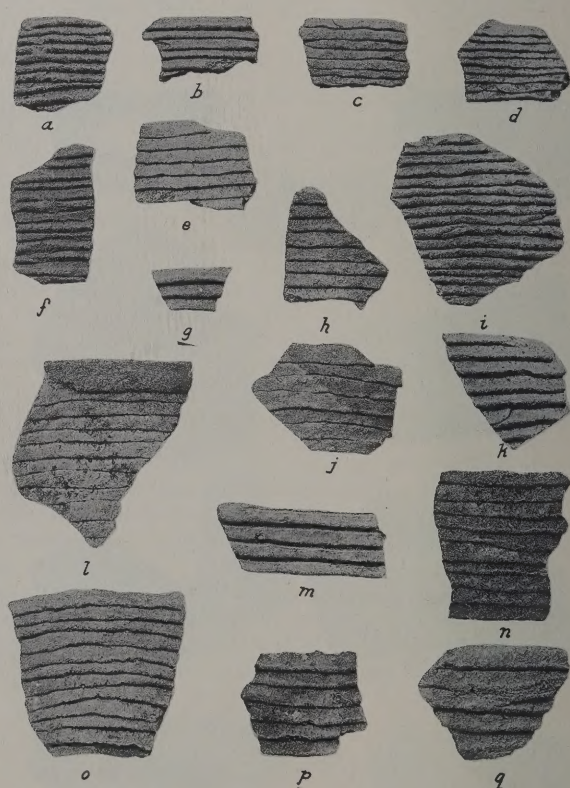


FIG. 150

FIGURES 147-150

POTSHERDS FROM PUEBLO II LEVELS ON ALKALI RIDGE, except for 149, *m*, Pueblo III. Fig. 147, miscellaneous handles from Mancos Black-on-white vessels. Fig. 148 shows the size range of indented corrugation in Pueblo II. Fig. 149, rim types of Pueblo II corrugated jars with a typical Mesa Verde Pueblo III rim, *m*, for comparison. Fig. 150, plain (not indented) corrugation in Pueblo II.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
147, <i>a</i> *, <i>b</i>	7	kiva fill	149, <i>a</i> *	9	Room B
<i>c</i> , <i>d</i>	12	refuse mound	<i>b</i> *	11	house area, N. central
<i>e</i>	2	" "	<i>c</i> *	12	refuse mound
<i>f</i>	7	kiva fill	<i>d</i> *	12	Room G
<i>g</i>	11	post houses, W. end	<i>e</i> *	11	post houses, W. end
<i>h</i>	5	refuse mound	<i>f</i> *	3	refuse mound
<i>i</i>	8	" "	<i>g</i> *	11	" "
<i>j</i>	12	Room B, fill	<i>h</i> *	9	" "
<i>k</i> *	8	refuse mound	<i>i</i> *	11	post houses, W. end
<i>l</i>	3	" "	<i>j</i> *	3	refuse mound
<i>m</i>	7	kiva fill	<i>k</i> *, <i>l</i> *	7	kiva fill
<i>n</i>	3	refuse mound	<i>m</i> *	1	Unit 1, kiva, floor
<i>o</i> *	12	Kiva 1, floor	Max. width, <i>a</i> : 13.7 cm.		
Max. width, <i>a</i> : 8.2 cm.			150, <i>a</i>	7	Room A
148, <i>a</i>	12	refuse mound	<i>b</i>	8	refuse mound
<i>b</i>	9	kiva, top fill	<i>c</i> , <i>d</i>	12	" "
<i>c</i>	12	refuse mound	<i>e</i>	7	Room A
<i>d</i> , <i>e</i>	5	" "	<i>f</i> , <i>g</i>	8	refuse mound
<i>f</i>	7	kiva fill, in roof logs	<i>h</i>	7	Room A
<i>g</i>	11	post houses, W. end	<i>i-k</i>	12	refuse mound
<i>h</i>	12	refuse mound	<i>l</i> *	7	kiva fill
<i>i</i>	7	kiva fill	<i>m</i>	11	house area, N. E.
<i>j</i>	8	refuse mound	<i>n</i>	7	kiva fill
<i>k</i>	5	" "	<i>o</i>	11	post houses, W. end
<i>l</i>	12	" "	<i>p</i>	7	Room A
<i>m</i>	7	kiva fill	<i>q</i>	5	House T, near floor
<i>n</i> , <i>o</i>	7	Room A, fill	Max. width, <i>a</i> : 4.2 cm.		
<i>p</i> , <i>q</i>	12	refuse mound			
<i>r</i>	5	" "			
Max. width, <i>a</i> : 9.7 cm.					

* Denotes rim sherd.

NOTES

FIG. 147. *a*, pitcher neck with vertical strap-handle. *b*, the most pronounced hook terminal found. *c*, shows the attachment end of a loop-handle, like *l*. *d* is a small pierced lug, a type common on Pueblo I jars and found occasionally in Pueblo II. *e* is part of a hollow ladle handle; clay pellets and small stones were sometimes placed in these to make a rattle. *f* and *g* show the indentation in horizontal strap-handles for large jars. *i* is a solid, wrap-around lug. *o* is a handle on a long-necked pitcher bearing one of the few zoöomorphic designs found (see fig. 142).

FIG. 148. Indented corrugated sherds from Alkali Ridge, showing size range in thickness of coils in specimens from Pueblo II sites. Many of the standard indentation techniques are shown. Note the regular wavy effects of *d* and *f*, the rectangular effects in *e* and *l*, and the finger-nail incisions on *i*, *j*, *k*, *m*, and *p*.

FIG. 149. Rim types of Pueblo II corrugated jars, with a typical Mesa Verde Pueblo III corrugated rim sherd, *m*, for comparison. Note the relatively small size of the Pueblo II rim fillet. This is a good period diagnostic on Alkali Ridge. In *e* the rim fillet is no larger than those in the body of the vessel. Note the ornamental applique fillet on *i* and the small loop-handle on *j*. These occur occasionally, mostly on small jars. In *g* a special decorative treatment, an unusual feature, is seen at the bottom of the rim fillet.

FIG. 150. Plain (not indented) corrugated sherds from Pueblo II levels. Except for use on parts of vessels to produce a design effect, this trait is usually not found in Pueblo III. In *m* the demarcation between coils is emphasized by incising.

FIGURE 151

POTSHERDS FROM ALKALI RIDGE, FROM PUEBLO II LEVELS, except for *a, d, b, u-u''*, Pueblo III. *i* and *o*, surface specimens, cannot be assigned a period on grounds of association; on typological grounds I would place *i* in Pueblo III and *o* in Pueblo II.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
151, <i>a</i> *	13	Room 206	151, <i>k</i>	8	refuse mound
<i>b</i> *	3	Room E	<i>l</i> *, <i>m</i> *	12	" "
<i>c</i> *	7	kiva fill, burial	<i>n</i>	5	House T, near floor
<i>d</i> *	13	Unit 1, Room U ₃	<i>o</i> *	—	Alkali Ridge, surface
<i>e</i> *	12	refuse mound	<i>p</i>	13	Unit 4, surface
<i>f</i> *	3	" "	<i>q</i>	3	refuse mound
<i>g</i>	12	" "	<i>r, s</i>	12	" " Pot 5, Burial 1
<i>b</i>	13	Room 209, top fill	<i>t</i> *	12	" "
<i>i</i>	—	Alkali Ridge, surface	<i>u-u''</i>	2	" "
<i>j</i>	3	surface			

Max. width, *f*: 5.5 cm.

* Denotes rim sherd.

NOTES

a-b, sherds from bowls with painted black-on-white interiors and corrugated exteriors; on *a, d*, and *b* the style of the painted decoration is Mesa Verde Pueblo III, the rest are Mancos Pueblo II. *i*, an unusual sherd, part of a jar with body decorated in black-on-white and neck corrugated; *j, k*, and *m*, black-on-white painted designs applied over corrugations, Pueblo II; *l*, the smallest "vessel" found, half of which is present here; *n* shows a design technique of late Pueblo II which later becomes prominent in Mesa Verde Black-on-white; *o* is a Pueblo II bowl with design reminiscent of Pueblo I Abajo Red-on-orange; *p*, sherd from vessel covered with nodules each of which is painted with a spiral line. *q*, an enigmatic Pueblo II sherd with corrugation on the inside of a curve; no reasonable conjectural reconstruction or other satisfactory explanation has appeared; solutions are solicited. *r, s*, Pueblo II, paint applied over basket markings; *t*, part of a large, indented base, black-on-white jar from Pueblo II Site 12. *u-u''*, 3 views of the base of a false-bottom Mesa Verde Pueblo III rattle-mug from Site 2; *u* shows only the true bottom, *u'* has a small part of the false bottom, *u''* has almost all of the false bottom in place; pellets between the bottoms furnished the rattle.



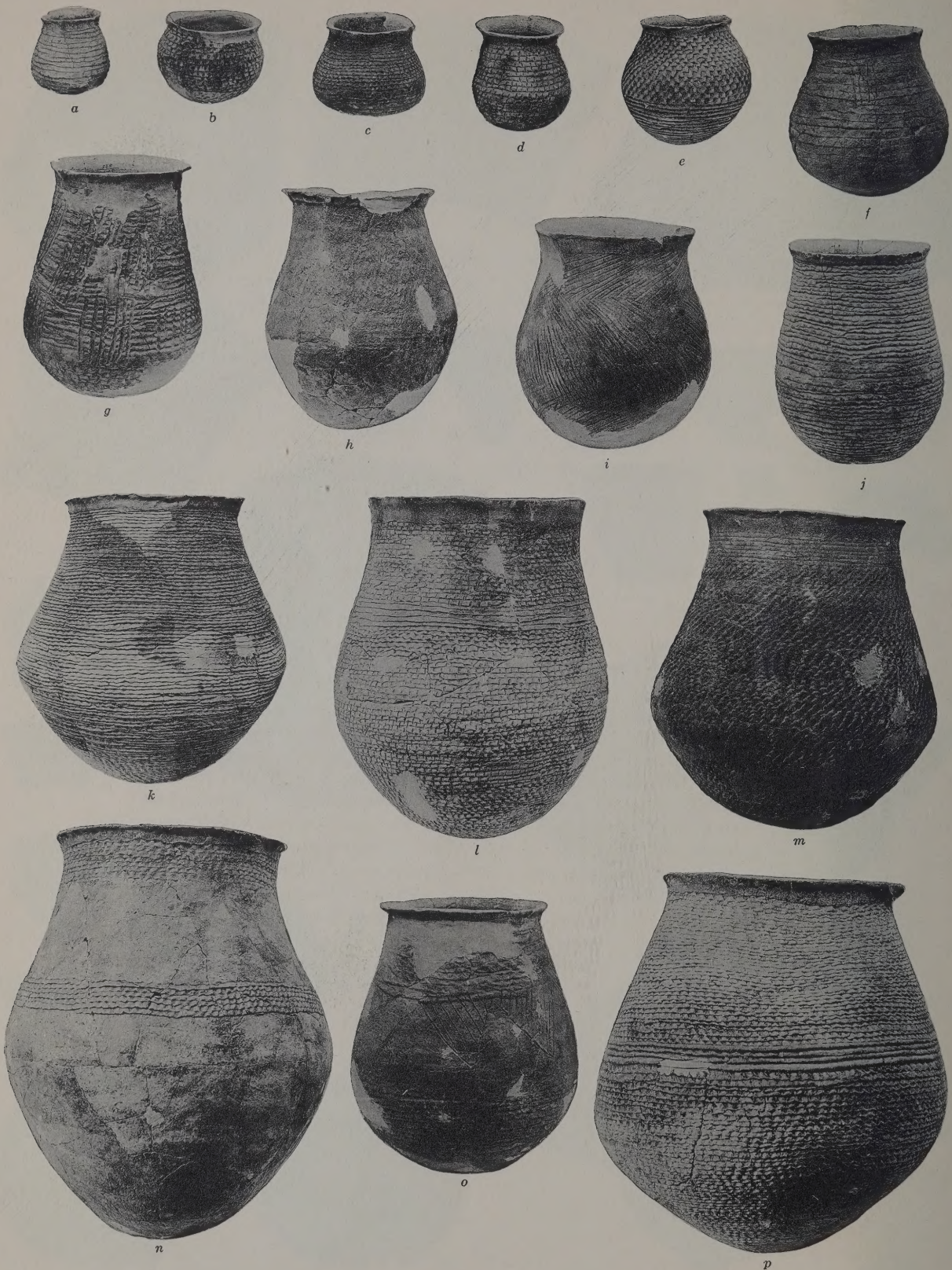


FIGURE 152

JARS FROM ALKALI RIDGE, PUEBLO II LEVELS, corrugated, incised, and plain; all unpainted. These vessels mark an experimental period in Pueblo ceramics.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
152, <i>a</i>	12	Kiva 1, bench, W. recess	152, <i>b</i>	12	Room D
<i>b</i>	7	kiva, bench, N.E. recess	<i>i</i>	5	refuse mound, Pot 4, Burial 10
<i>c</i>	5	refuse mound, Burial 2	<i>j</i>	5	refuse mound, Pot 2, Burial 8
<i>d</i>	8	" " Pot 1, Burial 1	<i>k, l</i>	9	Room B
<i>e</i>	12	" " Pot 3, Burial 1	<i>m</i>	11	kiva fill, below bench
<i>f</i>	5	" " Pot 2, Burial 9	<i>n, o</i>	12	Room D
<i>g</i>	9	E. of Room A	<i>p</i>	13	Unit 1, Room U ₂
					Height of <i>k</i> : 35.6 cm.

NOTES

Note the different indentation techniques in *a-e*. *e* has plain (not indented) coils on bottom half (shown in fig. 191, *f*). *f* has 4 parallel incised lines across the coils, repeated on opposite side. *g*, somewhat wider lines cross the coils in groups of 5; note also the varying indentation technique. *b*, a plain jar. The bottom resembles in appearance the crudely smoothed exterior of the large early Pueblo II black-on-white basins (fig. 111, *u*). Note the stroke marks on the upper part. *i*, incised decoration only. It is rarely found alone, usually in combination with other techniques. *j* and *k* are indented corrugated jars with no marked variations. In shape they come close to defining the range for Pueblo II wide-mouthed large jars on Alkali Ridge. The wide, squat form is restricted to small vessels like *b* and *c*, the largest we found being fig. 153, *j*. The rather marked shoulder seen in *k* and *m* is a good Pueblo II diagnostic in the Mesa Verde area. In the Pueblo III jars the shoulder is much less abrupt, fig. 153, *i*. *l, m*, and *p* show the use of a few bands of unindented coils to produce variety in the vessel wall. This is one of the few Pueblo II variations of the corrugated technique to continue into Pueblo III. *n* is a similar variation achieved by obliterating the coils of all save a few bands in 2 groups. *o* is a prime example of Pueblo II experimentation and well merits Roberts' term, "Exuberant Corrugation." Designs are incised with lines and punctate dots on a smoothed band around the middle of the jar, bordered by ordinary indented corrugation. For further examples, see figs. 158-162.

FIGURE 153

ALKALI RIDGE POTTERY. *a*, *b*, *g*, and *i* are from Pueblo III horizons, the remainder from Pueblo II. *a* and *b* are examples of the famous Mesa Verde mug. *e*, *e'* is a bowl molded in one of the so-called Pueblo cylindrical baskets.

PROVENANCE					
FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
153, <i>a</i>	1	Unit 1, refuse mound	153, <i>f</i>	3	refuse mound, Burial 2
<i>b</i>	2	refuse mound, Burial 2	<i>g</i>	2	" "
<i>c</i>	8	" " , Pot 2	<i>h</i>	12	" " , Burial 2
		Burial 2	<i>i</i>	6	house area
<i>d</i>	3	refuse mound, Burial 1	<i>j</i>	11	kiva floor
<i>e</i> , <i>e'</i>	5	" " , Burial 6	<i>k</i>	12	refuse mound, Burial 3
Diam. of mouth, <i>e'</i> : 17.8 cm.					

NOTES

a, *b*, these are the only whole specimens of the very common Mesa Verde Black-on-white mug we found in our relatively limited excavations in Pueblo III horizons. Mug sherds are shown in fig. 168 and a false bottom from a rattle-mug in fig. 151, *u-u'*. *c*, note scythe-like design incised across plain and indented coils; also, wrap-around lugs. *d*, a small jar with a *single* horizontal loop-handle. *e*, *e'* was molded in a coiled basket. Basketry impressions are found in most southwestern pottery industries. Usually, the pot is merely started in the basket, so that the impression is only on the base of the pot. Pueblo II and Pueblo III sites in the Mesa Verde area, however, produce examples of vessels molded to completion inside baskets. Sherds from such vessels were found at all Pueblo III sites, including 6a and 6b, and at Pueblo II Sites 11 and 12. The "cylindrical" basket made an admirable mold. When dried out in the sun the clay would shrink sufficiently for easy removal of the pot from the mold. The specimen shown here was originally taller, the present rim being merely the retouched edge of an irregular fracture (see fig. 164 for basket-molded sherds). *f* and *g* are platters; *g* from the Pueblo III section of the Site 2 refuse mound. It is an unusual piece; the only platter found on Alkali Ridge which was made as such, the others being merely re-used fragments, usually bottoms, of broken vessels. They were widely used in kivas and are often found on the bench, or broken on the floor in front of the bench. *h*, small jar with simple meander incised through the corrugations. *i*, a Mesa Verde Pueblo III corrugated jar; note the regularity of the indentations, the heavier lip, the more spherical shape, the generally smoother appearance—all these things are characteristic of Pueblo III corrugation in comparison with that of Pueblo II in southeastern Utah and southwestern Colorado.



a



b



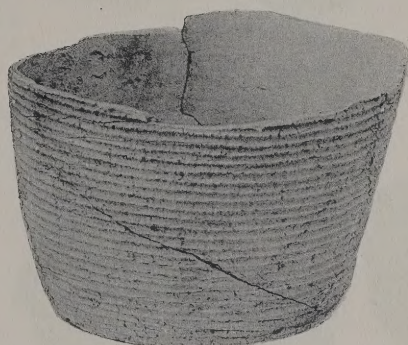
c



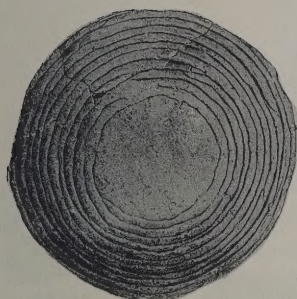
d



e



e'



f



g



h



i



j



k

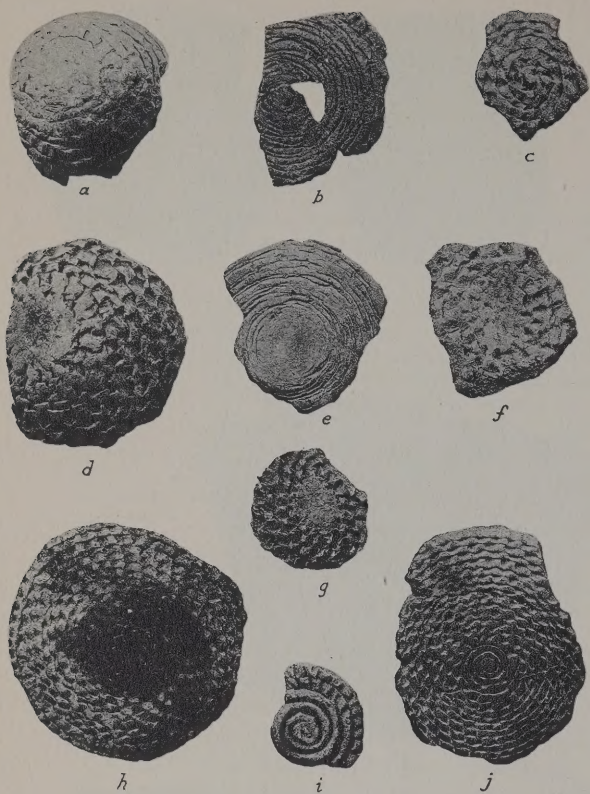


FIG. 154

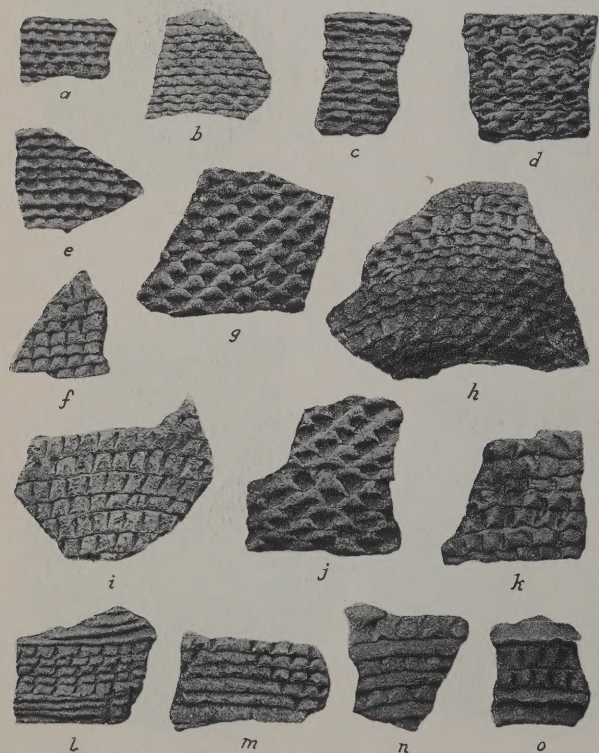


FIG. 156

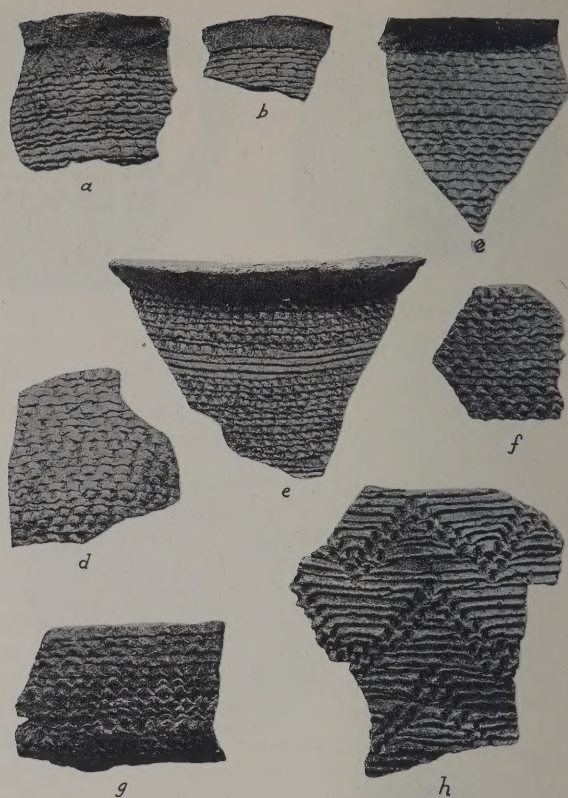


FIG. 155

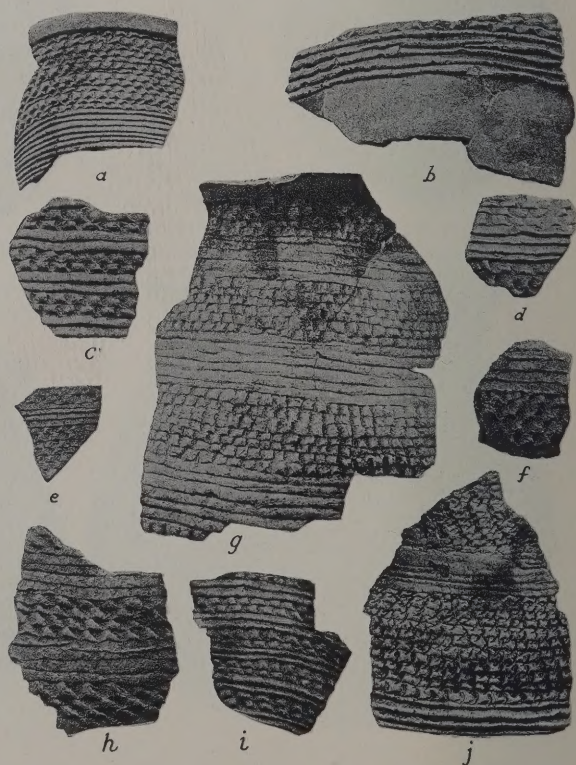


FIG. 157

FIGURES 154-157

POTSHERDS, ALKALI RIDGE CORRUGATED WARES. Figs. 154, *b*, *j*, and all of 156 are from Pueblo III levels. Fig. 155, all from Site 13, Unit 1, where the black-on-white wares were in transition between Pueblo II and Pueblo III types. Figs. 154, *a-g*, *i* and 157 are from Pueblo II levels. Fig. 154 shows a variety of corrugated jar bases.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
154, <i>a</i>	—	Alkali Ridge, surface	155, <i>g</i>	13, Unit 1	S. of Room U ₁
<i>b</i>	12	Room L	<i>b</i>	"	Room U ₃
<i>c</i>	9	kiva, top fill	Max. width, <i>a</i> : 9 cm.		
<i>d</i>	7	kiva fill, in roof logs	156, <i>a</i>	6	refuse mound
<i>e</i>	12	refuse mound	<i>b</i>	2	" "
<i>f</i>	5	" "	<i>c</i>	6	kiva, top fill
<i>g</i>	12	" "	<i>d-o</i>	6	refuse mound
<i>h</i>	6	kiva fill, near floor	Max. width, <i>a</i> : 3.9 cm.		
<i>i</i>	7	kiva fill	157, <i>a</i> *	7	prelim. test
<i>j</i>	1	Unit 1, kiva fill	<i>b</i>	12	Kiva 1, floor
Max. width, <i>a</i> : 8 cm.			<i>c</i>	7	Room A
155, <i>a</i> *	13, Unit 1	S. of Room U ₁	<i>d</i>	11	refuse mound
<i>b</i> *	"	kiva, top fill	<i>e</i>	3	" "
<i>c</i> *	"	S. of Room U ₁	<i>f</i>	5	" "
<i>d</i>	"	Room U ₃	<i>g</i> *, <i>i</i> , <i>j</i>	7	kiva fill
<i>e</i> *, <i>f</i>	"	Room U ₁ , fill	<i>h</i>	3	refuse mound
			Max. width, <i>a</i> : 11 cm.		

* Denotes rim sherd.

NOTES

FIG. 154. Even on the bottoms of jars the superior regularity of Pueblo III corrugation is apparent in *b* and *j*.

FIG. 155. *a*, note the smearing down of clay from the rim fillet over the top 3 body coils, perhaps a move toward the heavy rim which became characteristic of Mesa Verde corrugated jars (fig. 149, *m*). *b* shows a specialized use of indented corrugation technique which might be called *indentation design*. It is one of the 2 types of Pueblo II "exuberance" in corrugation which were used regularly in Pueblo III. It can be used positively or negatively; that is, the body of the pot may be in plain coils and the design in indentation, as in this example, or *vice versa*, as in fig. 159, *b*. For the second type to survive into Pueblo III, see notes for fig. 157.

FIG. 156. Although Site 6 seems to be early in the development of Pueblo III, some of the corrugation has achieved the regularity characteristic of that period in the Mesa Verde area. Note particularly *g* and *j*. Not only is Pueblo III indentation more regular than that of Pueblo II, but it also, in general, cuts deeper; that is, the relief is greater.

FIG. 157. *a*, *b*, *g*, and *j* are good examples of "exuberant corrugation" from early Pueblo II levels. *b* is from the middle of a jar which probably had the coils on the lower half completely obliterated, a rare trait on Alkali Ridge. We found no restorable pieces of that type, but sufficiently large sherds were found at Sites 7, 9, and 12 to establish its presence on the Mesa in early Pueblo II times.

Arrangement of alternating groups of indented and unindented coils, as in *c*, *g*, *h*, and *i*, continued as a decorative technique into Pueblo III times, along with *indentation design*.

j, note how the finger-nail incisions often cut into more than one coil.

FIGURES 158-161

CORRUGATED POTSDHERDS FROM PUEBLO II HORIZONS ON ALKALI RIDGE, SHOWING VARIATIONS, EXPERIMENTAL TECHNIQUES, ETC. Roberts' Pueblo II "Exuberant Corrugation." It must be realized, however, that in our Alkali Ridge Pueblo II levels this material was always in the minority. All-over corrugation, with a single style per vessel, predominated at every site. All the sherds in fig. 159 came from the Site 3 refuse mound; max. width, *a*: 3.2 cm.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
158, <i>a-c</i>	12	refuse mound	160, <i>e</i>	8	refuse mound
<i>d</i>	9	" "	<i>f</i>	11	kiva, top fill
<i>e</i>	7	kiva fill	<i>g-k</i>	12	refuse mound
<i>f</i>	9	refuse mound	<i>l</i>	11	House A, top floor
<i>g</i>	12	" "	Max. width, <i>a</i> : 15 cm.		
<i>h</i>	3	Room E, top fill	161, <i>a-d</i>	3	refuse mound
<i>i</i>	3	refuse mound	<i>e</i>	8	" "
<i>j, k</i>	12	" "	<i>f</i>	3	" "
<i>l, m</i>	7	kiva fill	<i>g</i>	8	" "
Max. width, <i>a</i> : 5 cm.			<i>h-k</i>	3	" "
160, <i>a*</i>	3	kiva, top fill	<i>l</i>	8	" "
<i>b</i>	8	refuse mound	<i>m</i>	8	house area
<i>c*</i>	12	" "	<i>n</i>	8	refuse mound
<i>d*</i>	11	kiva floor	Max. width, <i>a</i> : 5.2 cm.		

* Denotes rim sherd.

NOTES

FIG. 158. This shows incision applied to corrugation, except *f* which shows fillets crossing at odd angle. Note ring-dots in *g*. *i* shows plain coils, indented coils, incised line, and punctate dot, all on 1 small sherd. In *h* the incisions are so close together that the coils have a quite different effect than usual. This sherd, from Room E, Site 3, looks as though it might have come from the same vessel as 159, *p*, from the Site 3 refuse mound.

FIG. 159. This plate, together with 158, *i*; 160, *a*, and 161, *a-d*, *f*, *h-k*, gives some indication of the variety which may be encountered in the "exuberant corrugation" from 1 small site.

FIG. 160. The lines crossing the coils in this plate are, for the most part, considerably broader than those in fig. 158. *a*, note the stroke running up onto the rim fillet. Note also that, although incised lines are often used over indented corrugation, in many cases (such as figs. 158, *i*, *l*; 159, *o*; and 160, *b*, *l*), the coils are left plain in the areas intended for incising.

FIG. 161. *e*, note the non-parallel fillets.

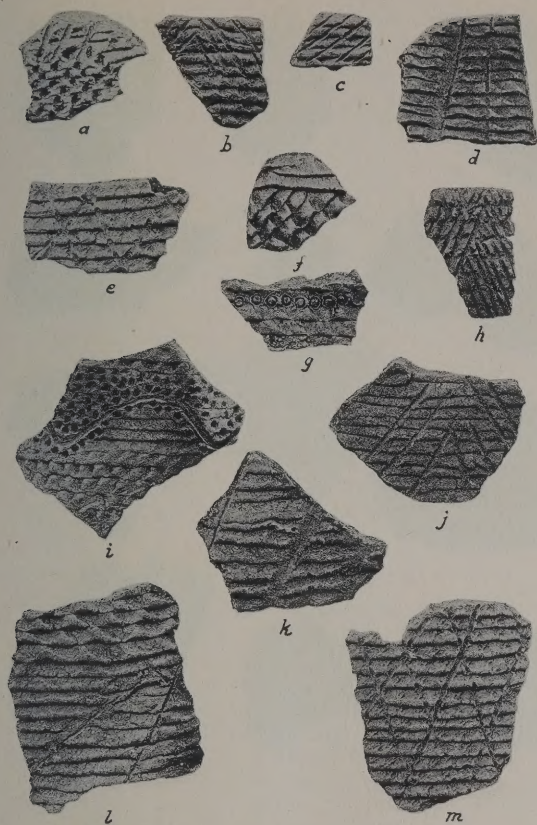


FIG. 158

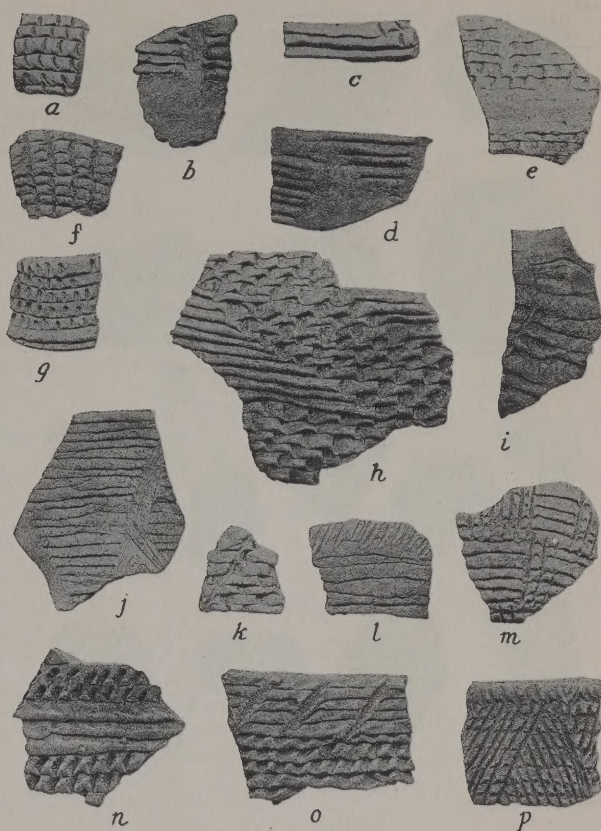


FIG. 159

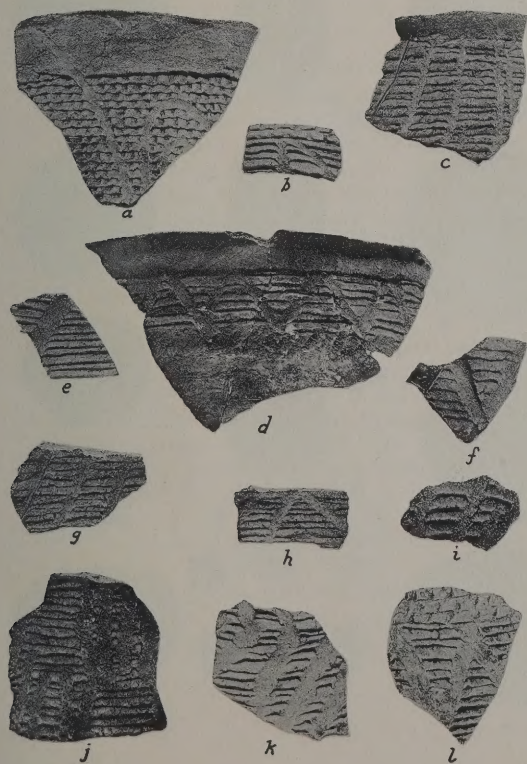


FIG. 160

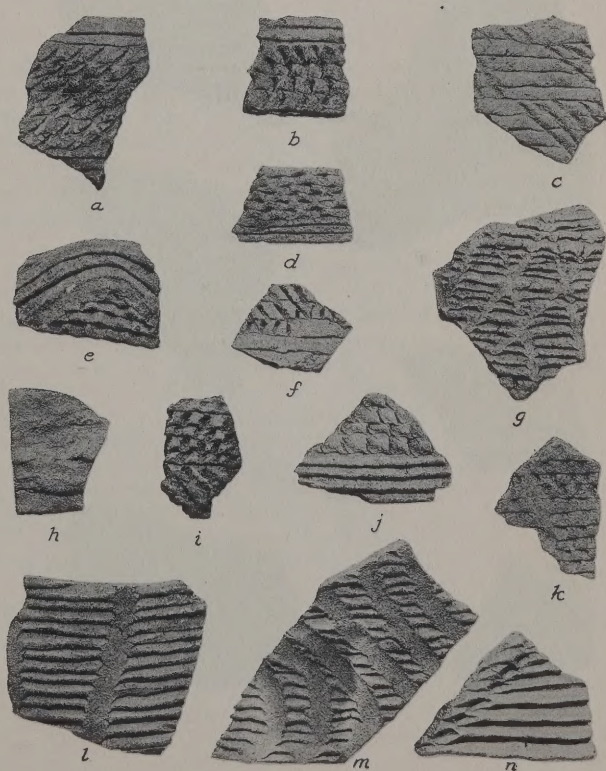


FIG. 161

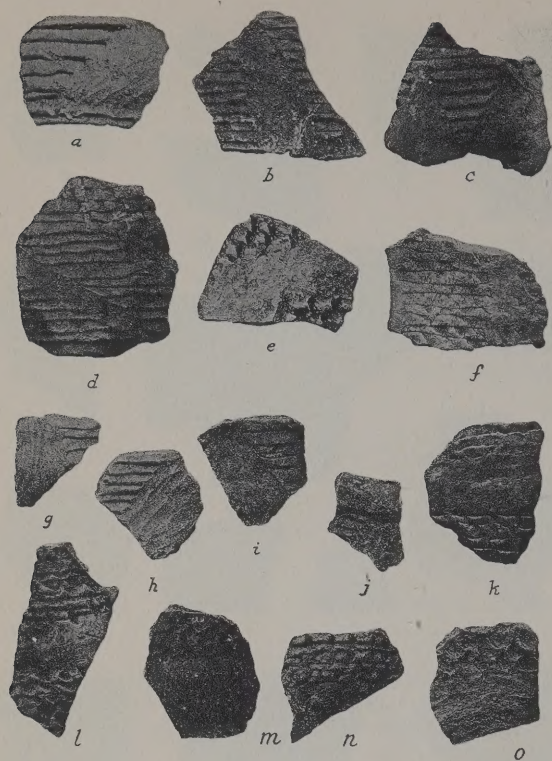


FIG. 162

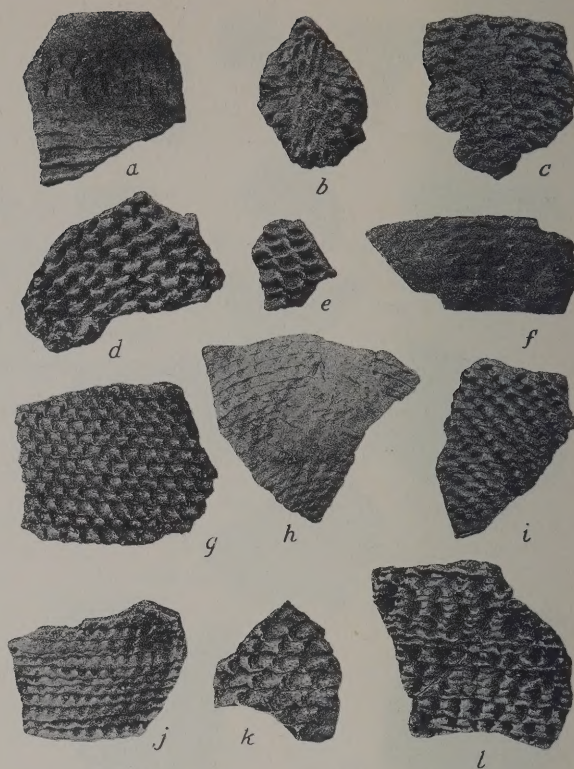


FIG. 163



FIG. 164

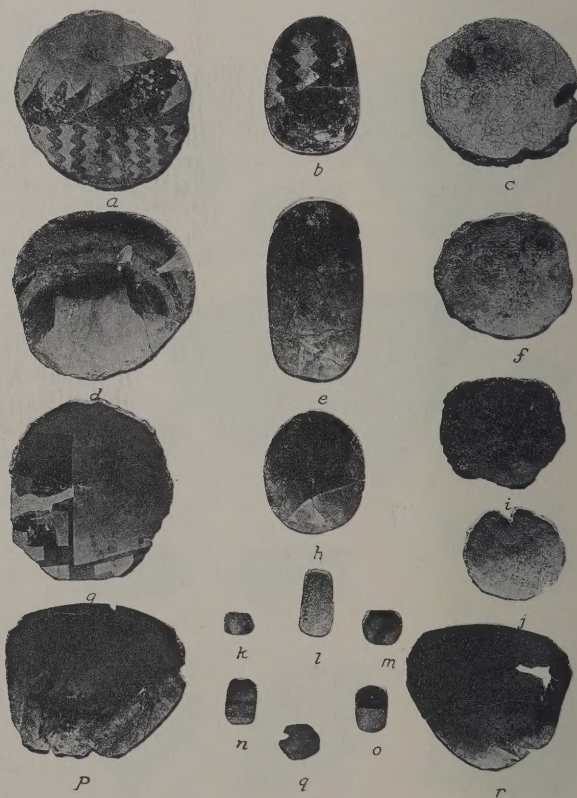


FIG. 165

FIGURES 162-165

POTSHERDS FROM ALKALI RIDGE. Fig. 162, corrugated sherds from Pueblo II horizons, showing use of smoothed areas for decoration. Fig. 163, types of Pueblo II corrugation, including 2 patched specimens. Fig. 164, sherds from pots molded in coiled baskets, all from Pueblo III levels, except *b*, Pueblo II. Fig. 165, re-used sherds from Pueblo I levels, Site 13. The larger were used for dishes and scoops, the smaller probably as small tools and gaming pieces.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
162, <i>a</i>	12	refuse mound	164, <i>a</i> *	6	refuse mound
<i>b</i>	12	Room E	<i>b</i>	11	" "
<i>c</i>	7	kiva fill	<i>c</i>	1	large refuse mound
<i>d</i>	5	refuse mound	<i>d</i>	6b	refuse mound
<i>e, f</i>	12	" "	<i>e</i>	6	" "
<i>g</i>	11	" "	<i>f</i>	1	large refuse mound
<i>h</i>	3	kiva, near floor	<i>g</i>	—	refuse mound, ruin N.W. of Black's cabin
<i>i</i>	9	refuse mound			Max. width, <i>a</i> : 6 cm.
<i>j</i> *	7	Room A	165, <i>a</i>	13	Room 99A
<i>k, l</i>	12	refuse mound	<i>b</i>	13	" 86
<i>m</i>	11	post houses, W. end	<i>c</i>	13	Pit House A, floor
<i>n</i>	12	refuse mound	<i>d</i>	13	Room 100A
<i>o</i>	5	" "	<i>e</i>	13	" 81
		Max. width, <i>a</i> : 7.8 cm.	<i>f</i>	13	" 214
163, <i>a</i> *	7	kiva fill	<i>g</i>	13	" 86
<i>b</i>	11	house area, N.E.	<i>h</i>	13	" 81
<i>c</i>	7	kiva fill	<i>i</i>	13	" 99A
<i>d</i>	11	" floor	<i>j, k</i>	13	" 241
<i>e</i>	11	house area, N. central	<i>l-o</i>	13	Pit House N
<i>f</i>	12	Room D	<i>p</i>	13	Room 106
<i>g</i>	7	Room A	<i>q</i>	13	Pit House N
<i>h</i>	3	kiva, top fill	<i>r</i>	13	Room 113
<i>i</i>	8	refuse mound			Max. width, <i>a</i> : 15 cm.
<i>j</i>	9	" "			
<i>k</i>	11	house area, N.E.			
<i>l</i>	11	" " , N. central			
		Max. width, <i>a</i> : 7.7 cm.			

* Denotes rim sherd.

NOTES

FIG. 162. Note triangles in *c*. This must have been an effective design. *k* is upside down.

FIG. 163. *a*, indentations in a smoothed area under the rim, apparently with a slight secondary smoothing or pressure after the incisions had been made. *b* and *h* have clay patches, baked on. In *b*, note the incisions on the patch. On *b* there was a marked addition of clay on the inside, as well, and a slight increase on the inside of *b*. *f* is a kind of low-relief corrugation, some of which was found in all the early Pueblo II sites on Alkali Ridge. It has diagonal ridges which give a pleasing effect, and the walls are considerably thinner than in other types of corrugation, a more delicate affair, altogether.

FIG. 164. A few basket-molded sherds are usually to be found on the surface of all large Mesa Verde Pueblo III refuse mounds. We also found them at the small Pueblo III Site 6 and in 2 Pueblo II sites, Sites 11 and 12. In addition, the whole vessel, fig. 153, came from a Pueblo II burial at Site 5. Note the wider coils on *b*. All sherds on this plate except *g* have white slip inside. *a*, *e*, *d*, and *f* have black-on-white designs on the inside, and one may assume that they would also probably be found on *b* and *c* if we had larger pieces. *c* and *f* also have designs on the exterior, painted over the basket markings (as have fig. 151, *r*, *s*); *c*, black-on-white; *f*, black on unslipped gray paste. The trait was never popular. The specimens already mentioned are all that we found except 4 more very small pieces from the surface of large Classic Mesa Verde Pueblo III refuse mounds. *g*, a surface sherd, is different from the others. It has no interior slip, and the interior has the relatively crude smoothing of a jar, not the fine smoothing of a bowl. Nor, judging by the curve in the sherd, was it made in a flat-bottomed "cylindrical" basket. It is possible that this is from a jar that was merely begun in a basket, the more usual Pueblo custom, with markings only at the base.

FIG. 165. *c*, *f*, *i*, *j*, *l* are unpainted Lino Gray ware, the rest Abajo Red-on-orange. *m*, *p*, and *r* are rim sherds. Most of the large specimens are base sherds of bowls or jars.

FIGURES 166-169

MESA VERDE BLACK-ON-WHITE POTSDHERDS FROM PUEBLO III HORIZONS ON ALKALI RIDGE. Figs. 166, 167, bowl interiors; 168, mug exteriors; 169, jar exteriors.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
166, <i>a*</i> , <i>b*</i>	1	large refuse mound	167, <i>m*</i>	—	hilltop site, E. of Camp 1
<i>c*</i>	1	" " "	<i>n*</i>	1	large refuse mound
<i>d*</i>	2	refuse mound	Max. width, <i>a</i> : 6.2 cm.		
<i>e*</i>	6	" " "	168, <i>a*</i>	6	refuse mound
<i>f*</i>	1	large refuse mound	<i>b</i>	1	large refuse mound
<i>g*</i>	6	refuse mound	<i>c*</i>	—	hilltop site, E. of Camp 1
<i>h*</i>	13	Unit 1, kiva, top fill	<i>d*</i>	1	large refuse mound
<i>i*</i>	6	refuse mound	<i>e*</i>	6	refuse mound
<i>j</i>	1	large refuse mound	<i>f</i>	6b	" " "
<i>k*-m</i>	1	Unit 1, refuse mound	<i>g</i>	1	large refuse mound
<i>n</i>	1	Unit 1, plaza level, S. of house	<i>h</i>	13	Unit 1, kiva, top fill
<i>o</i>	6	refuse mound	Max. width, <i>a</i> : 6.8 cm.		
Max. width, <i>a</i> : 8.8 cm.			169, <i>a, b</i>	1	Unit 2, kiva, below bench
167, <i>a*</i>	1	surface	<i>c</i>	13	Unit 1, kiva, top fill
<i>b*</i>	1	large refuse mound	<i>d</i>	1	Unit 2, kiva floor
<i>c*, d*</i>	2	refuse mound	<i>e</i>	1	Unit 1, Room 3, floor
<i>e*</i>	—	hilltop site, E. of Camp 1	<i>f</i>	2	refuse mound
<i>f*</i>	6b	refuse mound	<i>g</i>	13	Unit 1, Room U1, fill
<i>g*</i>	—	hilltop site, E. of Camp 1	<i>h</i>	6b	refuse mound
<i>h*, i*</i>	1	large refuse mound	<i>i</i>	13	Unit 1, Room U1, fill
<i>j</i>	1	Unit 1, refuse mound	<i>j</i>	1	Unit 2, kiva floor
<i>k</i>	—	hilltop site, E. of Camp 1	Max. width, <i>a</i> : 14.6 cm.		
<i>l*</i>	1	large refuse mound			

* Denotes rim sherd.

NOTES

For other Mesa Verde Black-on-white designs, see figs. 68, *d*; 75; 76, *c-b*; 77-80. Although most of the bowl sherds are from the rim, none of these had exterior designs.

FIG. 166. The ground color of *d* is unusual, close to Maerz and Paul 14B4. The nearest Ridgway reading, which is not so close, is XXX 21" K (buffy olive). *e* is part of the top of a "seed bowl." Note the rim design on *k*. Mesa Verde bowl rim patterns are shown in Morris, 1939, fig. 58.

FIG. 167. *k* probably should be oriented with the terrace design as in *j*. *m* shows the type of paint, carbon, which some students consider a prerequisite for taxonomic classification as Classic Mesa Verde Black-on-white.

FIG. 168. *d* shows a complete vertical section of the mug wall. *g* and *h* are from the base of the wall. Note lower attachment for mug handle in *h*.

FIG. 169. In the picture *a* seems to be a polychrome. We found enough sherds treated in this manner to suggest the possibility that it was more than an accident. It will be noted that, of the 4 2-tone bands on this sherd, the pair on the right have framing lines darker than the filler wash, while in the pair on the left the intensities are reversed. *e* and *j* are designs which might be classified as "doodles." They occur on the lower parts of large jars, below the formal design-band. The bottom of the main design can be seen on *e*. They may be for brush-testing. In Pueblo IV Hopi country jars isolated designs in similar position are often very carefully made (birds, moths, etc.) but those on Mesa Verde jars are usually very crude and are fairly represented by these 2 examples.



FIG. 166



FIG. 167



FIG. 168



FIG. 169

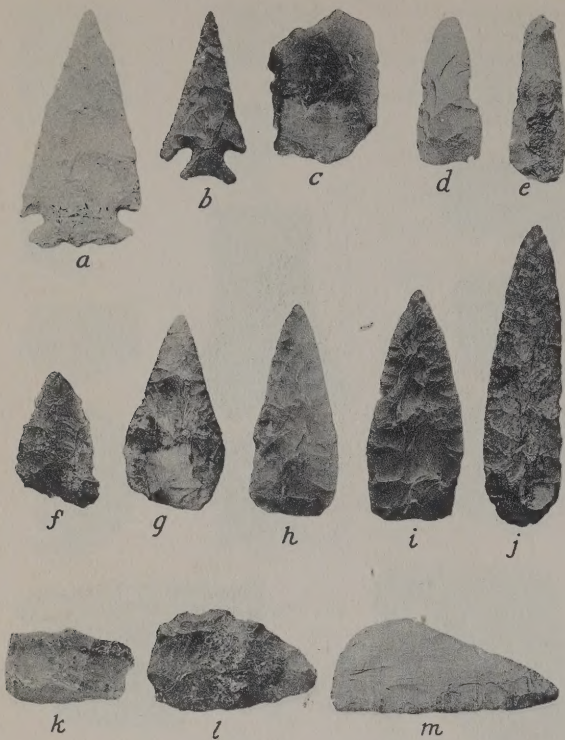


FIG. 170

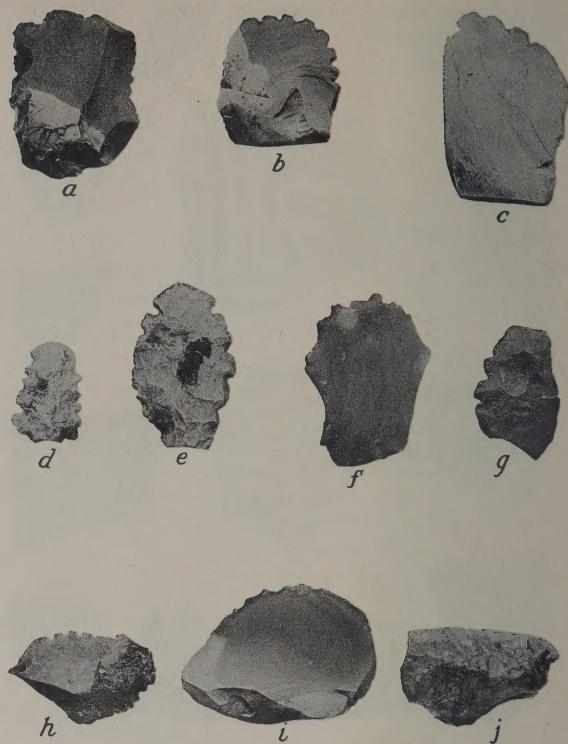


FIG. 171

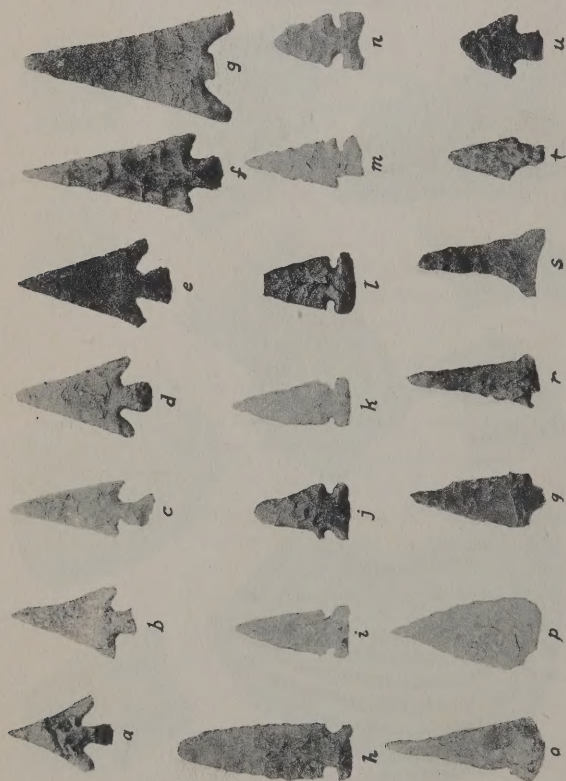


FIG. 172

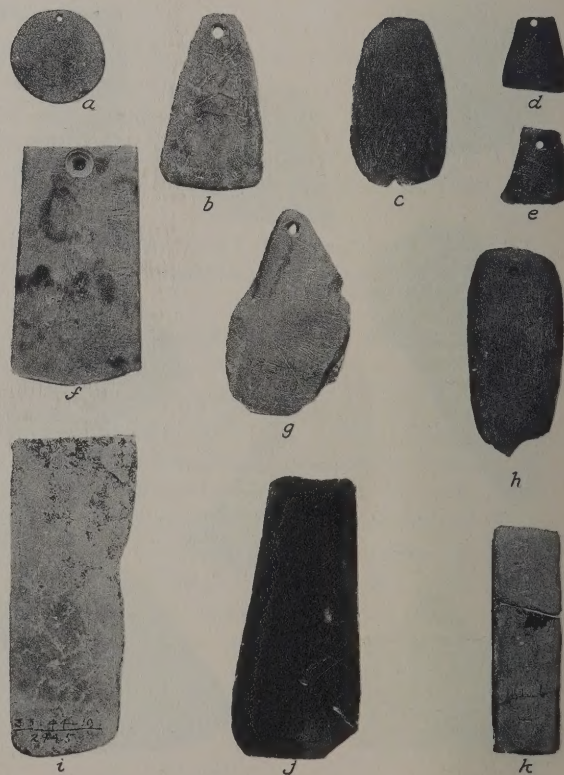


FIG. 173

FIGURES 170-173

ALKALI RIDGE STONE ARTIFACTS. Fig. 170, chipped-stone points, scrapers, and knives. Fig. 171, chipped-stone implements with serrated edges, saws and saw-scrapers. Fig. 172, chipped-stone points and drills. Fig. 173, pendants and other flat stone objects.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
170, <i>a</i>	13	Pit House E, floor	172, <i>f</i>	13	Room 100A
<i>b</i>	12	Room G	<i>g</i>	13	" 240
<i>c</i>	13	surface	<i>h</i>	5	refuse mound
<i>d</i>	13	Room 226	<i>i</i>	11	Room A, fill
<i>e</i>	13	" 108	<i>j</i>	3	refuse mound, Burial III
<i>f</i>	13	Pit House A, floor	<i>k</i>	11	Room A, fill
<i>g</i>	13	Room 221	<i>l</i>	11	post houses, W. end
<i>h</i>	13	" 2	<i>m</i>	11	kiva fill, below bench
<i>i, j</i>	13	" 100A	<i>n</i>	5	Kiva 1, fill
<i>k</i>	13	" 249	<i>o</i>	13	Pit House E, fill
<i>l</i>	2	kiva fill, below bench	<i>p</i>	13	Room 299
<i>m</i>	—	ruin S.W. of Black's Spring	<i>q</i>	13	" 222A
Height, <i>a</i> : 7.6 cm.			<i>r</i>	13	Pit House C, floor
171, <i>a</i>	12	Room D	<i>s</i>	2	refuse mound
<i>b</i>	11	kiva, top fill	<i>t</i>	13	Room 100A
<i>c</i>	12	Room D	<i>u</i>	13	" 249
<i>d</i>	11	kiva, top fill	Height, <i>a</i> : 2.6 cm.		
<i>e</i>	12	Room D	173, <i>a</i>	13	Unit 2, kiva floor
<i>f</i>	12	" L, fill near floor	<i>b</i>	13	Room 240A
<i>g</i>	5	refuse mound	<i>c</i>	13	" 74
<i>h</i>	12	Room D	<i>d</i>	5	Kiva 1, top fill
<i>i</i>	8	refuse mound	<i>e</i>	13	Room 15A
<i>j</i>	12	Room D	<i>f</i>	13	Pit House E
Height, <i>a</i> : 5.5 cm.			<i>g</i>	13	Room 124
172, <i>a</i>	13	Pit House D	<i>h</i>	13	Pit House B
<i>b</i>	13	" C, floor	<i>i</i>	13	Room 294
<i>c</i>	13	Room 208	<i>j</i>	13	Pit House G
<i>d</i>	13	Pit House G	<i>k</i>	13	" " E
<i>e</i>	13	Room 300	Height, <i>b</i> : 5.8 cm.		

NOTES

FIG. 170. All from Pueblo I levels except *b*, Pueblo II, and *l, m*, Pueblo III. *c, e* are end-scrapers; *e* seems a highly generalized tool which could serve as knife, point, and/or scraper-chisel. *m*, the site from which this comes is, though small, typical of the Classic Mesa Verde Pueblo III "canyon-head" type, described and illustrated in Morley, 1908.

FIG. 171. All from Pueblo II levels. *a, c, e, h, j*, and other less definite pieces were found in a jar. These tools were surprisingly effective when tried on modern lumber. *b*, to an unskilled hand, was the fastest. *a*, saw; flake retouched on 3 edges. *b*, saw; retouch on curved edge only. *c*, saw; retouch at top only. *d*, saw or serrated point. *e*, saw; retouched except for butt. *f*, saw-scrapers; serrated at top, retouched for scraper at bottom. *g*, saw-scraper; serrated at left, scraper retouch at right. *h*, saw; retouch at top only. *i*, saw; retouch on curved edge only. *j*, saw; retouch at top only.

FIG. 172. *a-g*, tanged points from Pueblo I level, Site 13. *h-n*, notched points from Pueblo II levels. *o-u*, miscellaneous points, *s* and some others probably drills. Arrow-point typology with one other (bone fleshers) provided the only examples of "period diagnostics" which proved out 100%. All points found in levels we have called Pueblo I were flanged, and all those in our Pueblo II-III levels were notched; there was no overlap — an ideal situation resulting largely, in all probability, from the ridiculously small number of arrow-points found; all that were even approximately whole are shown on this plate. *a* is of moss-agate.

FIG. 173. These objects all bear "use scratches" save *e* and *i*. *b* may be an ornamental pendant; the rest probably are not. Note drill holes started but not finished in *f, h*. In *f* holes are drilled in both sides but not quite through. *i* is very flat and smooth on one side only; a hole is drilled partly through on the other side (not shown).

FIGURE 174

CORN-GRINDING STONES FROM ALKALI RIDGE. *a, b, e*, from Pueblo I levels; the rest, Pueblo II. *a*, manos (hand-stones) and metates (nether stones) from Pit House A, Site 13. Most of the grinding stones found in Pueblo I pit houses were in the south end of the main room, south of the partition or wing-walls.

b, metate in the south end, Pit House B, Site 13; a good example of the Basket Maker III-Pueblo I troughed metate, showing the characteristic untrimmed outline.

c, a Pueblo II troughed metate and mano. Note that the nether stone has been carefully shaped, all over, not simply in the groove and upper surface as in Pueblo I stones.

d, metate and manos from Kiva 2, Site 12. The earliest flat-top metates we found on Alkali Ridge were in Pueblo II levels.

e, 7 of the 9 metates found on the floor or leaning against the walls of Pueblo I Room 100A, Site 13.

f, manos from the jacal houses, Site 12.

g-i, grinding bins in Room B, jacal houses, Site 12. The metates were flat-topped. Note the groove worn by the mano in the upright slab on the right in *g* and *i*. Grinding bins in modern Hopi houses are usually arranged in sets of 3, graduated as to fineness.



a



d



f



b



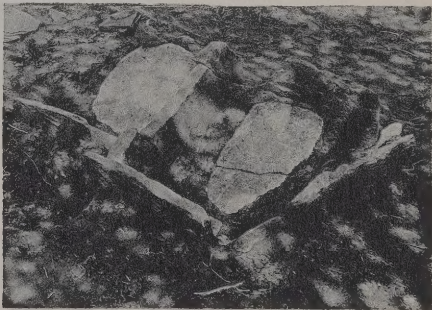
b



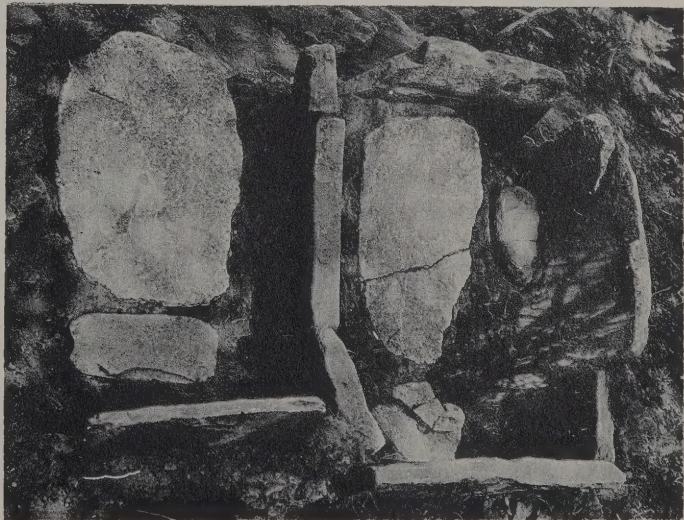
c



e



g



i



FIGURE 175

ARTIFACTS FROM ALKALI RIDGE, except *f* and *g* which are Basket Maker baskets from the Grand Gulch region shown for comparison with Abajo Red-on-orange designs. *a, b*, from Pueblo I levels; *c, c', e, i, k*, from Pueblo II; *d, h, j, l, m, n*, Pueblo III.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
175, <i>a</i>	13	Room 104	175, <i>b</i>	2	kiva fill
<i>b</i>	13	" 100	<i>i</i>	11	house area, N.E.
<i>c, c'</i>	5	refuse mound, Pot 7, Burial 8	<i>j</i>	1	Unit 1, kiva floor
<i>d</i>	1	Unit 1, kiva, sipapu rim	<i>k</i>	11	post houses, W. end
<i>e</i>	11	kiva fill	<i>l</i>	1	Unit 2, kiva fill, below bench
<i>f</i>	—	Grand Gulch region	<i>m</i>	12	Kiva 1, bench, E. recess
<i>g</i>	—	" " "	<i>n</i>	1	Unit 1, kiva, bench, S.E. recess

NOTES

a, clay object, use unknown. Similar objects, without bifurcated stem, are shown in Guernsey 1931, fig. 26. With this stem they have been called "miniature copies of bifurcated (carrying) baskets" (Morris, 1927, p. 154) which they certainly resemble. The mouth is a flattened oval, approximately 8.2 by 4.5 cm. The trough has a max. depth of 2.8 cm. Over-all height of the object, 7.8 cm. Ware: Lino Gray.

b, perforated clay object, possibly a spindle-whorl. Max. measurable diam.: 7.2 cm. Color: brick red.

c, Mancos Black-on-white ladle.

d, sipapu rim, buried in Pueblo III kiva floor (see fig. 85, *a*), fragment of unpainted blue-gray jar.

e, pipe of gray clay, curved stem; over-all length, 10.5 cm.; max. diam. of stem under bowl, 2.3 cm.; tapers to 1.2 cm. Bowl very carefully made, closely approximating a true circle, although when viewed from the side, as in this picture, the rim is wavy; diam. 6.2 cm.

f, g, Basket Maker baskets reproduced from Pepper, 1902, pp. 8, 10. Compare designs with Abajo Red-on-orange pottery designs.

h, i, hammerstones.

j, stone bowl or mortar found, containing charred beans (*Phaseolus vulgaris*), on floor of a Pueblo III kiva (see fig. 85, *a*). Over-all width, incl. handles, 22 cm.; height, 12 cm.; diam. of bowl, which is very true, 11 cm.; width of wall at rim, 2 cm.; depth of bowl, 6.2 cm.

k, celt of fine-grained laminated sandstone—"skinning knife"—tchamahia. Length, 25 cm.; max. thickness, 1.75 cm.

l, chipped-stone knife.

m, n, river pebbles, probably floor-polishers.

FIGURES 176-181

BONE AWLS FROM ALKALI RIDGE, arranged according to the classification in Kidder, 1932, p. 203, except that all mammal and bird bones are lumped together. Fig. 176, bone awls, Class a, head of bone intact. Fig. 177, Class b, head unworked, except by original splitting. Fig. 178, Class c, head partly worked down, except *g*, *k*, *l*, which are Class a; heads of *k* and *l* are broken but not worked. Fig. 179, various types from Pueblo I levels, Site 13. Fig. 180, Class d, head wholly removed. Fig. 181, Class e, awls made from bone splinters. Many of these awls were probably used by weavers.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
176, <i>a</i>	11	kiva fill, below bench	178, <i>k</i>	12	refuse mound, Burial 2
<i>b</i>	12	Kiva 2, fill, below bench	<i>l</i>	13	Room 297
<i>c</i>	6	kiva fill, below bench	<i>m</i>	13	" 107, floor
<i>d</i>	12	Room D	<i>n</i>	12	refuse mound
<i>e</i>	5	Kiva 2, below bench	Length, <i>a</i> : 10 cm.		
<i>f</i>	6	refuse mound	179, <i>a</i>	13, Pueblo I levels	Room 119
<i>g</i>	7	kiva fill, below bench	<i>b</i>	"	" 220
Length, <i>a</i> : 9.2 cm.			<i>c</i>	"	Pit House H, floor
177, <i>a</i>	13, Pueblo I levels	Room 240A	<i>d</i>	"	Room 199
<i>b</i>	"	Pit House C	<i>e</i>	"	Pit House B, top fill
<i>c</i>	"	" " A, near floor	<i>f</i>	"	Room 114A
<i>d</i>	"	Room 15A	<i>g</i>	"	Pit House D, S. antechamber
<i>e</i>	"	Pit House N, floor	Length, <i>a</i> : 8.2 cm.		
<i>f</i>	"	" " E, fill	180, <i>a</i>	"	Pit House C
<i>g</i>	"	Room 243	<i>b</i>	"	Unit 1, kiva, top fill
<i>h</i>	"	" 293	<i>c</i>	"	Pit House E, fill
<i>i</i>	"	" 107	<i>d</i>	"	surface
Length, <i>a</i> : 11 cm.			<i>e</i>	"	Room 247
178, <i>a</i>	13	Pit House H, fill	Length, <i>a</i> : 7.6 cm.		
<i>b</i>	13	Room 99	181, <i>a</i>	"	Room 201
<i>c, d</i>	13	Pit House E, fill	<i>b</i>	"	" 111
<i>e</i>	13	Room 240A	<i>c</i>	"	Pit House E, fill
<i>f</i>	13	" 14	<i>d</i>	"	pit S. of Room U1
<i>g</i>	13	Pit House E, fill	<i>e</i>	"	Room 111
<i>h</i>	13	Room 240A	<i>f</i>	"	Pit House E, fill
<i>i</i>	13	" 114	<i>g</i>	"	" " H, fill
<i>j</i>	13	Pit House E, floor	<i>h</i>	"	Room 206
			Length, <i>a</i> : 5.8 cm.		



FIG. 176



FIG. 177



FIG. 178



FIG. 179



FIG. 180

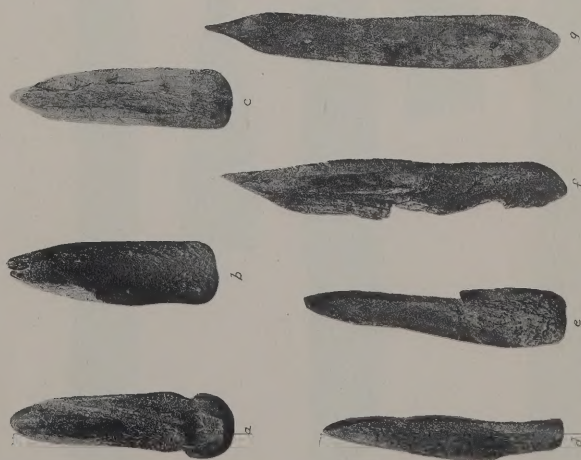
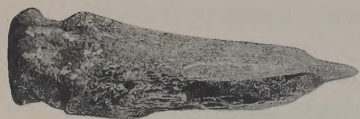


FIG. 181



a



b

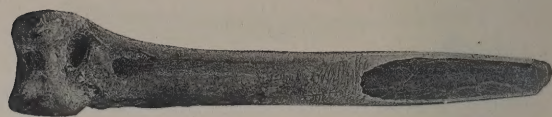


c



d

FIG. 182



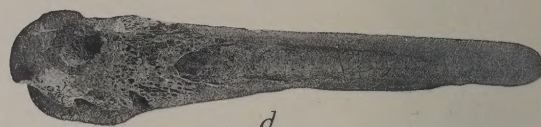
a



b



c



d

FIG. 183



FIG. 184



FIG. 185

FIGURES 182-185

BONE IMPLEMENTS FROM ALKALI RIDGE. Fig. 182, awls from Pueblo II levels, showing internal face of split metatarsals. Fig. 183, *a*, note high polish and use-marks on shank, end broken; this and *d* were probably weaving tools. *b*, one-time awl, with point removed and resulting blunt end level, smooth, and highly polished. *c*, rounded, saddle-shaped end smooth and polished; a suggested use is for polishing tubular bone beads. *d*, spatula. Fig. 184, Class d awls from Pueblo II levels. Fig. 185, blunt-ended implements, scrapers, etc., from Pueblo I levels, Site 13.

PROVENANCE					
FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	SITE	LOCATION IN SITE
182, <i>a</i>	7	Room B	184, <i>c</i>	7	Room B
<i>b</i>	8	refuse mound	<i>d</i>	11	post houses, W. end
<i>c</i>	3	" "	<i>e</i>	12	Kiva 2, near floor
<i>d</i>	11	kiva fill, below bench	185, <i>a</i>	13, Pueblo I levels	Room 13
Length, <i>a</i> : 9.8 cm.			<i>b</i>	"	Pit House D
183, <i>a</i>	11	kiva fill, below bench	<i>c</i>	"	Room 201
<i>b</i>	13	Room 115	<i>d</i>	"	Pit House C
<i>c</i>	13	" 297	<i>e</i>	"	" " B
<i>d</i>	11	post houses, W. end	<i>f</i>	"	Room 297
Length, <i>a</i> : 10.8 cm.			<i>g</i>	"	" 245A
184, <i>a</i>	7	Room B	<i>h</i>	"	" 116
<i>b</i>	12	post houses	<i>i</i>	"	" 240A
Length, <i>a</i> : 11.4 cm.					
					Length, <i>a</i> : 6.8 cm.

FIGURES 186-189

IMPLEMENTS OF BONE AND ANTLER FROM ALKALI RIDGE. Fig. 186, "fleshers," end-scrapers: *a*, Pueblo I; *b-d* from Pueblo II levels. These instruments, along with arrow-points, provided the only examples of 100% mutually exclusive typological divergence between levels of our assumed periods. The Pueblo I type is a segment of a long bone shaft with both ends functional; the Pueblo II type is a deer humerus with the distal condyle left intact, forming an excellent hand-grip. Again, as with the arrow-points, the number found was small, 10 of the first type and 3, all of which are shown here, of the second (2 of the latter were found with burials). However, Morris confirms the distinction, although in his findings the humerus type was restricted to Pueblo III horizons (Morris 1939, pp. 121, 122; pl. 107). Fig. 187, bone tubes, the shorter ones, at least, probably bone beads. Fig. 188, *a-i*, the so-called gaming pieces, except for *e*, which from the markings on it seems to have been a small tool. *j* appears to be a knife or side-scraper. *k* may be a net-gauge or thread-winder. *l* is 1 to 2 mm. thick, edges smooth but blunt. *m* is probably another weaving tool. Fig. 189, objects of antler: *a*, type classified as wrench; *d* could serve as a flaking tool.

PROVENANCE

FIG. NO.	SITE	LOCATION IN SITE	FIG. NO.	ALL SITE 13, PUEBLO I LEVELS
186, <i>a</i>	7	Pueblo I area C	188, <i>b-d</i>	Room 114A
<i>b</i>	8	refuse mound, Burial 1	<i>e</i>	" 116
<i>c</i>	11	Room B, beneath floor	<i>f</i>	" 114A
<i>d</i>	12	refuse mound, Burial 3	<i>g</i>	" 249
Length, <i>a</i> : 14.8 cm.			<i>b, i</i>	" 114A
187, <i>a</i>	13	Pit House A, floor	<i>j</i>	" 17
<i>b</i>	5	Kiva 2, fill, below bench	<i>k</i>	" 242A
<i>c</i>	7	kiva floor	<i>l</i>	" 99
<i>d</i>	12	refuse mound	<i>m</i>	Pit House G
<i>e</i>	5	house area, W. end	189, <i>a</i>	" " C, in firepit ash
<i>f</i>	12	refuse mound	<i>b</i>	Room 300
Length, <i>a</i> : 4.3 cm.			<i>c</i>	Pit House B
188, <i>a</i>	13, Pueblo I levels	Pit House E	<i>d</i>	" " A, near floor
Length, <i>a</i> : 2.3 cm.			Length, <i>c</i> , 8.2 cm.	

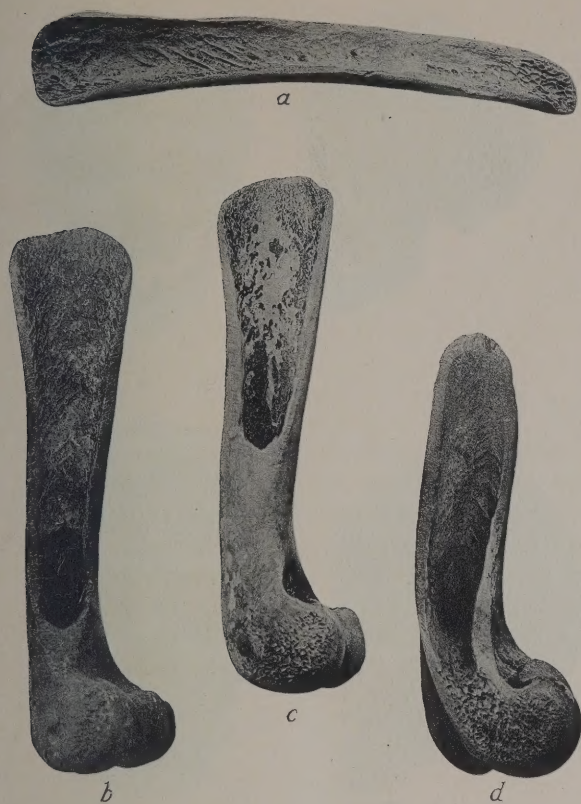


FIG. 186

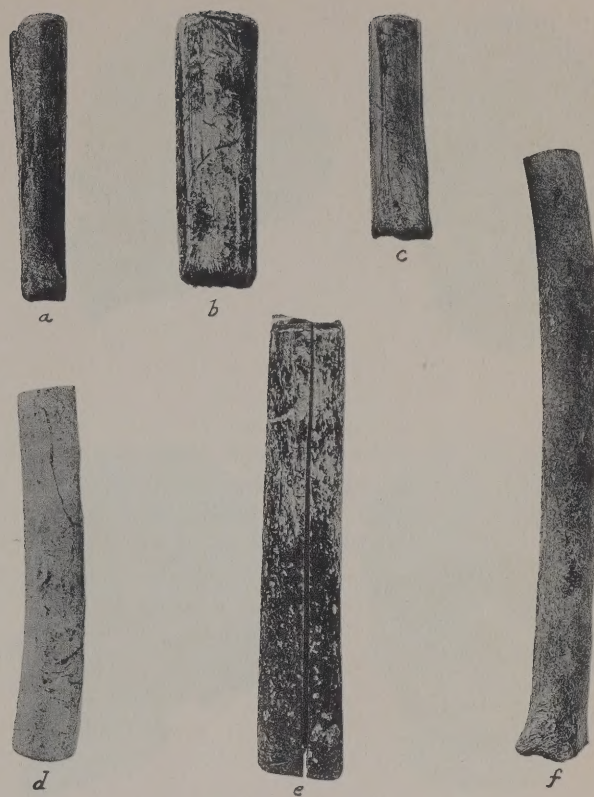


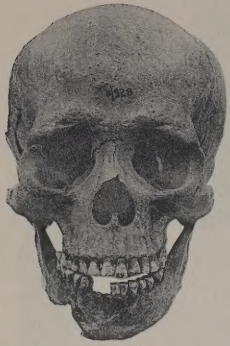
FIG. 187



FIG. 188



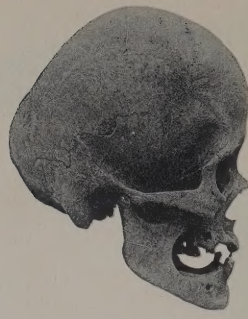
FIG. 189



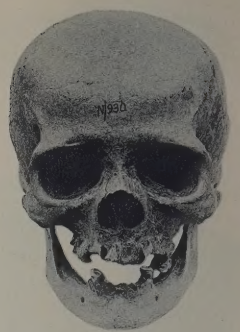
a



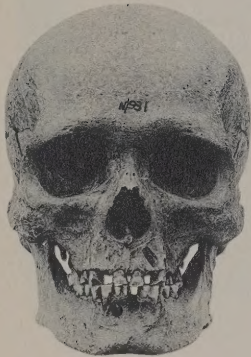
a'



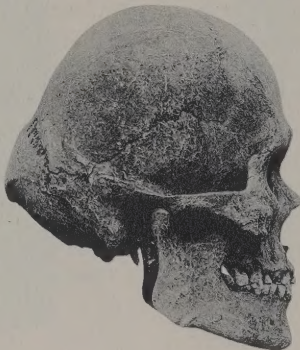
b



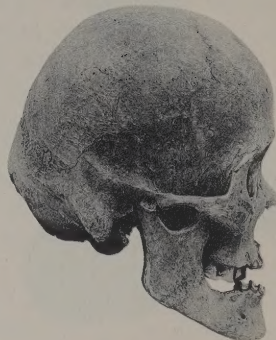
b'



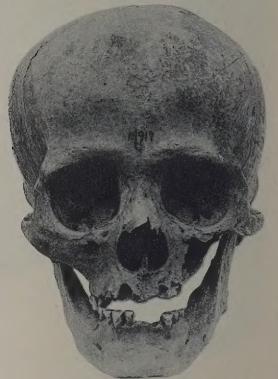
c



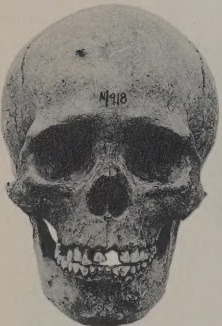
c'



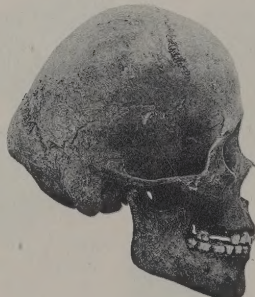
d



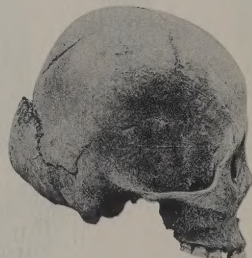
d'



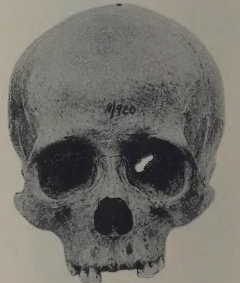
e



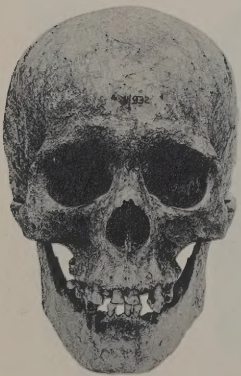
e'



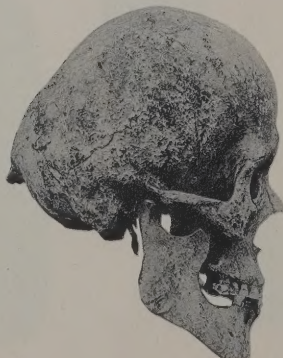
f



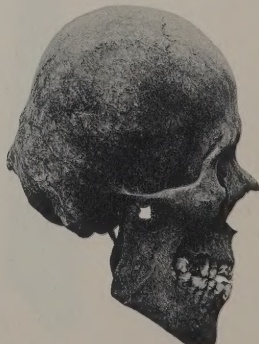
f'



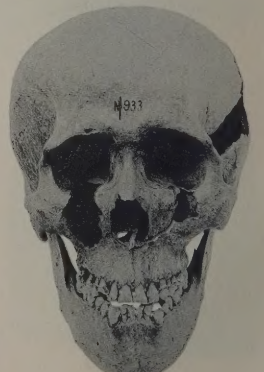
g



g'



h



h'

FIGURE 190

ALKALI RIDGE SKULLS, showing deformation — lambdoidal flattening. Note differences in face length and proportion between *c* and *b'*. The break in the left side of *b'* is believed to be the result of a blow administered before death (see p. 328). Part of an arrow-head was found imbedded in one of the dorsal vertebrae (fig. 191, *i-i''*). For illustrations of some of these *in situ*, see fig. 192.

PROVENANCE

FIG. NO.	CAT. NO.	SITE	LOCATION IN SITE
190, <i>a, a'</i>	N 928	5	refuse mound, Burial 9
<i>b, b'</i>	N 930	5	" " , " 11
<i>c, c'</i>	N 931	5	" " , " 12
<i>d, d'</i>	N 917	8	" " , " 1
<i>e, e'</i>	N 918	8	" " , " 2
<i>f, f'</i>	N 920	12	" " , " 3
<i>g, g'</i>	N 932	13	Pit House D, fill, near floor
<i>h, h'</i>	N 933	13	Unit 3, kiva, Skeleton 1, double burial

FIGURE 191

a-a', skull of Burial 6, Site 5, refuse mound. Peabody Museum catalogue no. N 925. Note asymmetrical deformation and apparent absence of deformation when viewed from the left side.

b, b', skull of Burial 1, Site 5, refuse mound. P. M. cat. no. N 921.

c, left side of pelvis fused to sacrum. Burial 3, Site 12, refuse mound. P. M. cat. no. N 920.

d, applied fillet of clay on neck of Lino Gray jar, Site 13, Pit House H. An interesting variation of the Pueblo I Banded Neck.

e, Basket Maker basket from southeastern Utah, reproduced from Pepper, 1902, p. 19, for comparison with Abajo Red-on-orange pottery designs, particularly fig. 55.

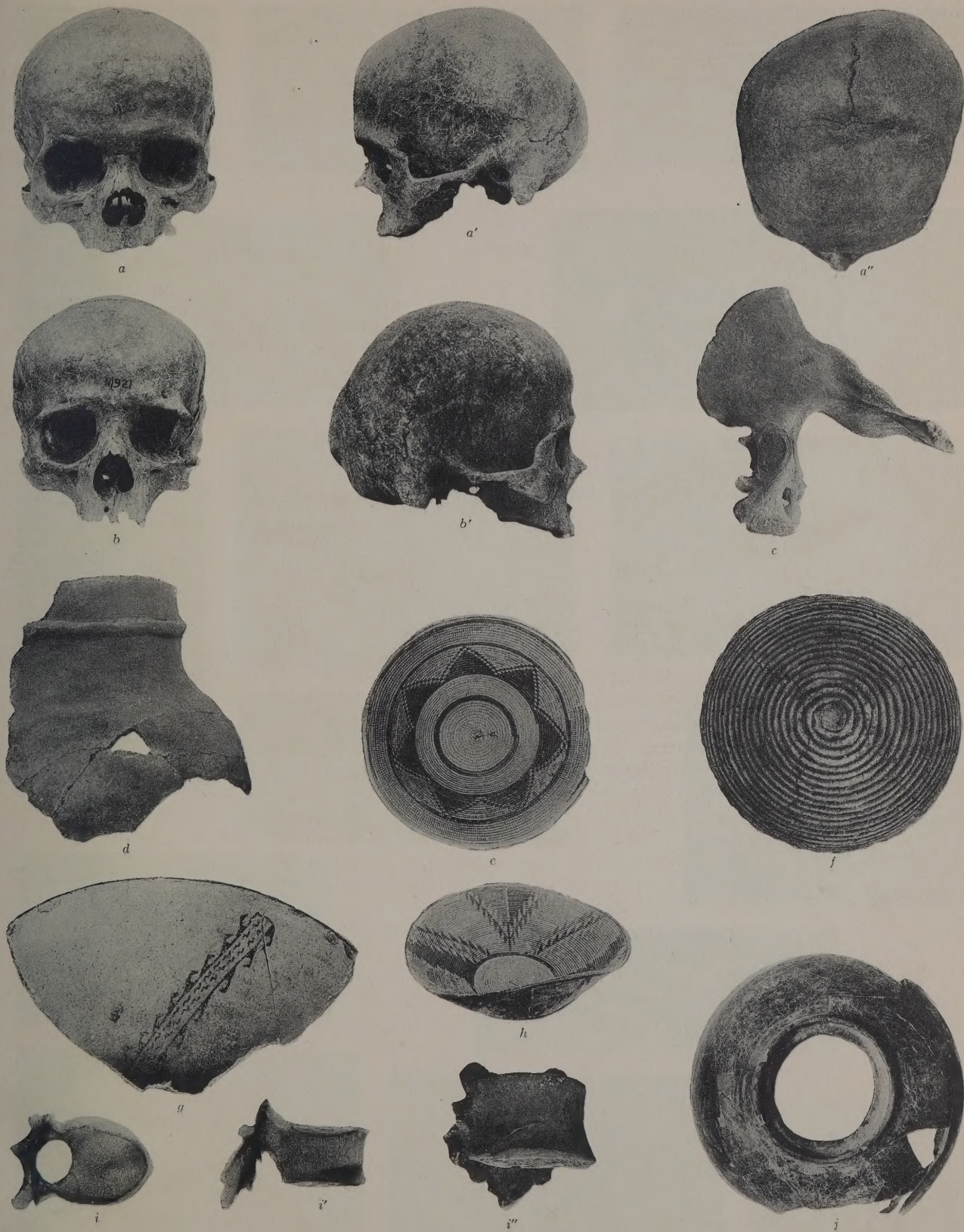
f, lower half of Pueblo II corrugated jar, viewed from the bottom; from Site 12, refuse mound, Pot 3, Burial 1; side view shown in fig. 152, *e*.

g, part of Basket Maker III black-on-white bowl from Site 13, Room 218A.

h, Basket Maker basket from southeastern Utah (Pepper, 1902, p. 19) for comparison with Abajo Red-on-orange pottery designs.

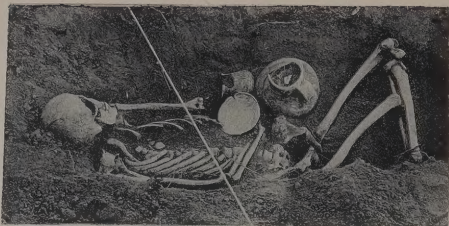
i-i', arrow-point fragment in dorsal vertebra of Skeleton 1; from the double burial in the kiva fill, Site 13, Unit 3. There is no sign of healing of the fractured bone. The X-ray photographs *i* and *i'* are through the courtesy of Dr. Charles Elliott Rounds, Malden, Massachusetts.

j, view, looking down, of the top part of a Mesa Verde "kiva jar," found broken on the floor of the kiva, Unit 1, Site 1. The purpose of the flange around the mouth is to support a lid (see fig. 114, *k, k'*). Ware: Mesa Verde Black-on-white.





a



b



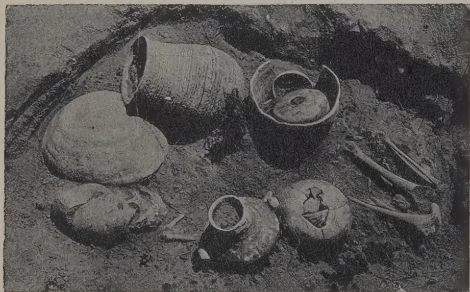
c



d



e



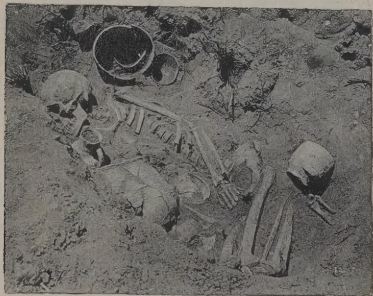
f



g



h



i



j



k



l



m



n



n'

FIGURE 192
ALKALI RIDGE BURIALS

PROVENANCE			
FIG. NO.	CAT. NO.	SITE	LOCATION IN SITE
192, <i>a</i>	—	3	refuse mound, Burial 3
<i>b</i>	N 922	5	" " " " 2
<i>c</i>	N 926	5	" " " " 7
<i>d</i>	N 923	5	" " " " 3
<i>e</i>	N 919	12	" " " " 1
<i>f</i>	N 927	5	" " " " 8
<i>g</i>	—	13	Unit 1, Room U2, Burial 1
<i>h</i>	N 928	5	refuse mound, Burial 9
<i>i</i>	N 933-34	13	Unit 3, kiva, double burial
<i>j</i>	N 921	5	refuse mound, Burial 1
<i>k</i>	N 925	5	" " " " 6
<i>l</i>	N 917	8	" " " " 1
<i>m</i>	N 935	13	Unit 1, Room U2, Burial 3
<i>n, n'</i>	N 932	13	Pit House D, fill, near floor

NOTES

Period attribution, determined by associated cultural material, location, and the nature of superimposed material. *n, n'*, Pueblo I (late); *a-f, h, j-l*, Pueblo II; *g, i, m*, Pueblo III. *a* was one of the few extended burials encountered. *d*, the break in the skull represents erosion. The burial was very shallow and the fractured edges were discovered projecting from the surface before excavation. The presence of terminal phalanges within a few centimeters of the surface in a burial of an adolescent indicates the high order of preservation in refuse mounds in much of the Mesa Verde area, when the material is undisturbed. *f*, one of the 2 burials found with 8 accompanying vessels. The 8th is the ladle (fig. 175, *c, c'*), the bowl of which may be seen in the hole at the bottom of the inverted bowl on the lower right. *g* is a child burial beneath a house floor, a Mesa Verde Pueblo III custom. *h* is the other burial at Site 5 which had 8 vessels. Note the plain base of the large corrugated jar. *i* is a double burial; at least one of the members met a violent death. *j* and *k* show the work of burrowing mammals in refuse mounds. The pot in the foreground in *k* is the basket-marked bowl (fig. 153, *e, e'*). *l*, Jolly Roger; note the bone scraper at his right shoulder. The object lying across the vertebral column is a tree-root. *m*, another Pueblo III sub-floor child burial. *n, n'*, the best preserved skeleton found; apparently buried in Pueblo I times near the floor of a Pit House at Site 13. Although no cultural material accompanied the burial, the fill about and above the bones bore Pueblo I potsherds.

For further information, see the orientation chart on p. 229 in the refuse mound section; statements under the heading "Burials" in the various site descriptions; measurements, observations, pathology and anomaly in Appendices A and B; and figs. 190, 191.

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